COTTON

A MONTHLY TECHNICAL JOURNAL DEVOTED TO COTTON ITS UTILIZATION AND PRODUCTS

VOL. XIV. ATLANTA, GA., JUNE, 1907. No. 8.

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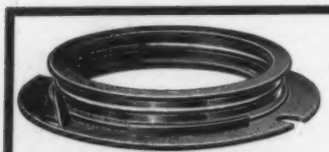

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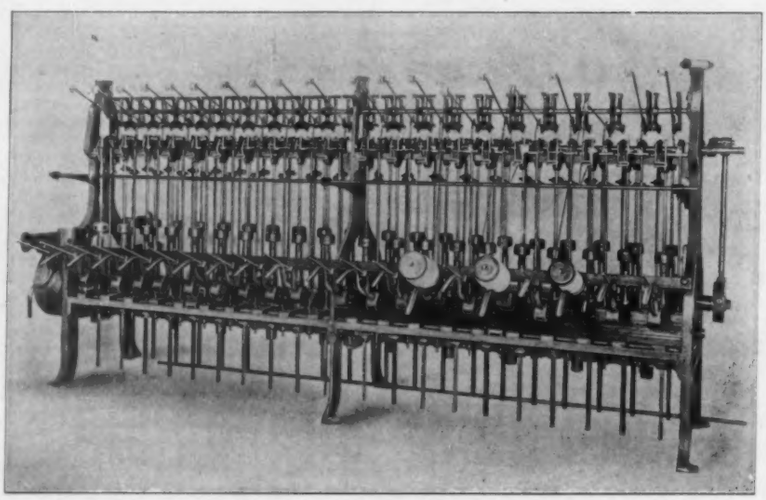

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COTTON

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PREFATORY COMMENTS.

We devoted the larger part of our May issue to the conventions in Philadelphia of the American Cotton Manufacturers' Association and the National Association of Hosiery Manufacturers, of what was to occur, and in this issue we give a full report of what did occur. These conventions were the most remarkable of their kind that ever took place in this country pertaining to the textile industry, not only in point of number in attendance but the character of the proceedings, and the magnificent exhibit of machinery employed in the textile art.

The abstracts of papers which appear in this issue will be read with unusual interest by the producer of the raw material, the merchant, the manufacturer and the practical man in the mill. Some of the papers we shall be obliged to omit at this time, but they will appear in subsequent issues without any loss of their significance, as matter that will be read with relish as touching upon current events materially affecting the course of the textile industry, which has now to be considered in its broad, economical phases, relating not only to the domestic but to foreign trade.

We devote considerable space to the paper on etamines and their classification under the customs tariff, by E. A. Hartshorn, and illustrate it with typical specimens of these goods, because of the importance which they have recently taken in the interpretation of certain portions of the cotton schedule of the tariff, as rendered by the United States Board of General Appraisers, most materially affecting a class of American manufactures that a number of fine cotton mills have taken up as meeting a consumptive demand which has heretofore been supplied from foreign sources. The manufacture of etamines and similar fabrics is a distinctive progress that has recently been made in the diversification of the character of cotton manufactures in this country, as taken up especially by some of the large mills of New England, which have been equipped for the making of fine and fancy fabrics, that have been and are now being imported to a considerable extent from the fine cotton mills of Europe.

We call particular attention to an abstract of the paper on "The Cooling and Humidifying of Textile Mills," by W. H. Carrier, as presenting a number of features of practical utility to all manufacturers, not only in the specific scheme presented, but in the general system of humidifying and cooling mills, wherever they may be situated, either in the North or in the South. Mr. Carrier has treated his subject in a very practical way, as meeting the ordinary requirements of factory conditions.

The question of factory cost accounting is always an interesting and vital one, which is little understood, yet presenting features of the utmost importance in mill economy. We, therefore, desire to call attention to the abstract of the paper on "Cost Acounting, An Economic Necessity," by J. L. Nicholson, which was read before the National Association of Hosiery Manufacturers. Mr. Nicholson brings out in his paper some valuable suggestions, which can readily be applied to any ordinary and approved system of book-keeping.

We shall give special prominence in our subsequent issues to the technical features of manufacturing, with articles from some of the best known and best qualified writers on textile subjects in this country and abroad, whose experience entitles whatever they may contribute to the greatest confidence for reliability, and who will treat their subjects in a manner that will be not only comprehensive, but thoroughly practical. With this strong corps of writers it is our intention to place COTTON in the van of textile publications.

LARGE YIELD OF RUSSIAN COTTON.

Last season's cotton crop in Russia is stated to have been the largest in history.

The most important cotton zone lies in the Ferghana district of Central Asia, where the area under seed in 1906 was 64,676 acres, against 61,658 in 1905. There were produced last season 241,665 tons (of 2,240 pounds each) of raw cotton, yielding 75,000 tons of clean cotton, the latter an increase of 3,335 tons over 1905. In the Syr-Darya district 10,090 acres were under seed, yielding 33,335 tons of raw cotton, or 15,000 tons of cleaned cotton. The Transcaspian district produced 10,000 tons of clean cotton from 9,250 acres. In Bokhara the area was reduced by nearly 1,000 acres, the cotton planting last season covering 4,625 acres, and 33,335 tons of clean cotton was collected in Bokhara, Khiva, and the district adjoining Persia. On the Caucasus approximately 8,335 tons of cotton were collected.

The foregoing figures show that the total cotton crop yielded approximately 147,500 tons of clean cotton, which is by 25 per cent. more than in any previous year.—*Consular Reports.*

THE ADVANTAGES OF CONFERENCES AND CONVENTIONS.

Never before in the history of trade and commerce throughout the civilized world has the importance of conferences and conventions among men following the same vocational lines of business been more realized and put into more practical effect than at the present time. These intercourses between those engaged in the same pursuits have been promoted, and the practical features carried into effect, by reason of the remarkable facilities of quick communication, allowing an interchange of views upon questions vitally affecting relations in which all are mutually interested in carrying on the necessities of a broad commerce in all industrial enterprises, involving issues on a scale never before dreamed of.

The trade of the world today must be considered in all of its aspects as a whole in which no one nation has an exclusive field of operation, but one in which all are participating in active competition. Manufacturing, trade and commerce must now be considered and conducted according to methods that are interrelated, and so bound together that they cannot be separated into particular spheres of activity, but must be taken as germane one to the other. It is, therefore, found in the textile field that there is such a community of interests, involving a domestic and foreign trade, which make it not only convenient but advantageous for those engaged in the same and collateral pursuits to confer together and discuss topics that bear upon and influence conditions of the general industry affecting its welfare, and the elements of its development that are so rapidly presenting themselves.

No matter what the disagreement in views may be between men, if the questions between them are discussed intelligently and with a due consideration of their consequences something of mutual advantage will arise. Men have always enjoyed association with one another, but today the facilities for gratifying this are vastly superior to anything ever before existing, and, for this reason, if for no other, they eagerly come together to compare views and agree upon policies for mutual good. The inspiration and value of such association is manifested in the frequent conferences that are held between textile manufacturers in the United States, in conjunction with those abroad, for the discussion of subjects that are held in common, not only in relation to the economies of manufacturing, but as the latter is related to the growth or culture of the raw material which they make use of.

The cotton manufacturers' conventions which have recently been held in Boston and Phidalelphia are conspicuous examples of the advantages derived from the intercourse of those engaged in the same occupation, for the purpose of meeting each other on a business and social equality, participating in discussions pertainng to their trade or listening to the reading of papers prepared by experts and students in the exposition of the practical features of manufacturing, and in economics, all for the advancement of the industry along substantial lines of progress. A consequence of this human spirit of association is seen in the broadening character and popularity of the two great cotton manufacturers' associations in this country allied, in principle, with either the southern or the northern branches of the industry, with a common object broad enough to take into their membership those belonging to either one of them. The National Association of Cotton Manufacturers is increasing its membership because of the valuable information that its members obtain by attending its meetings and perusing the reports of its transactions. This association has now a membership of nearly 800, or double the number that it had twelve years ago. The same intensity of interest is taken in the transactions of the American Cotton Manufacturers' Association.

As is well known, many points of value, advantageous to both the manufacturing and planting interests, resulted from the conference that was held last year between the cotton growers of the South and manufacturers of the United States and Great Britain. So important were some of the results of this conference that another one is proposed for next October which cannot result otherwise than of immense importance to those concerned, with special reference to the methods of cotton culture, the growth and preparation of the staple for manufacture into goods, and its proper handling for transportation to destination.

We thoroughly believe that the cotton manufacturers' conventions that have been held in Boston and Philadelphia will be of the utmost importance upon the cotton industry of the United States not only in reference to the methods employed in the manipulation of the raw material, but to those affecting trade as governed by changing commercial relations with the domestic and foreign markets.

DOCKHAM'S TEXTILE DIRECTORY.

The 1907, or Twenty-first edition of Dockham's American Report and Directory of Textile Manufacture and Dry Goods Trade, embracing cotton, woolen, sile, jute and linen manufacturers, has just been published, at $6.00. This directory has been regarded as the standard one for forty-one years, and the care with which it is prepared makes it particularly authentic. It gives a list of textile associations, bleacheries, cotton and wool dealers, besides a complete list, in alphabetical order, of textile manufacturers in the United States, Canada and Mexico, together with carefully compiled statistics relating to the textile industry, giving the number of cotton spindles, sets of wool cards, worsted combs, and looms.

SCIENTIFIC CREDIT REPORTING.

To meet the demands of the business world, and render the service which alone can justify their claim for recognition and the financial support of business men, mercantile agencies must improve their methods and adapt their plans to keep pace with the progress in other lines.

A recognition of these truths forms the foundation and guiding impulse of the Credit Office, No. 346 Broadway, New York City. The managers the this office have sought to profit by the experience of all who have labored in the field of credit reporting, adopting those features of other agencies which have demonstrated their efficiency, eliminating those shown to be worthless or unreliable, and devising new forms and methods by which to cement all into a unity.

This Office has established a highly scientific system of credit reporting, involving a careful process of selection and elimination, which cannot be elucidated in the short space that we can give in reference to it, but which is fully described and illustrated in a pamphlet issued by this Office, and which can be obtained by anyone writing for it.

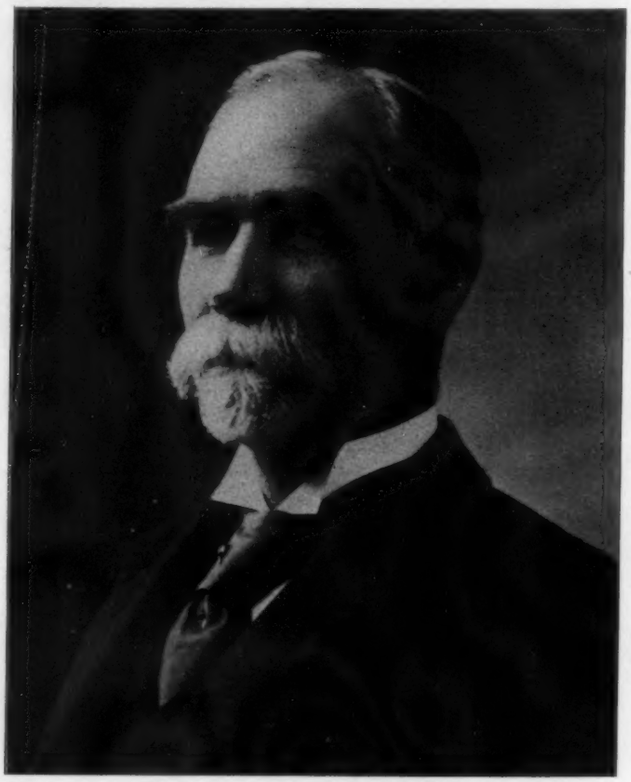
The system is patronized by some of the leading manufacturing and commercial concerns in the United States, such as: Allen-Lane Co., Boston; The American Woolen Co., New York City; Anchor Knitting Mills, Whitesboro, N. Y.; Avalon Knitting Co., Utica, N. Y.; Berkshire Mfg. Co., Pittsfield, Mass.; Bliss, Fabyan & Co., New York; Capron Knitting Co., Utica, N. Y.; Cone Export & Commission Co., Greensboro, N. C.; Deering, Milliken & Co., New York City; Jno. and Jas. Dobson, Philadelphia; Falls City Knitting Mills, Louisville, Ky.; Folwell Bros., Philadelphia; Loraine Mfg. Co., New York City; York Mfg. Co., New York City, and many others.

The Stafford Company, Readville, Mass., is sending to the Dominion Textile Co., Canada, 600 of its "Ideal" looms.

American Cotton Manufacturers' Association.

The eleventh annual convention of the American Cotton Manufacturers' Association was held in Philadelphia, May 15th and 16th, at the Bellevue-Stratford Hotel, and in point of numbers was the most successful gathering of cotton manufacturers ever held in the United States.

This association may be considered as thoroughly American as it is possible to make any organization of its kind, as its membership is pretty evenly divided between the North and the South, many of those in the National Association of Cotton Manufacturers being members of this. This fact will undoubtedly lead in time to the consummation of a union between the two associations so as to make one great national organization. The importance of such a movement as this is recognized, and some means will be found to bring it about, as the general sentiment greatly favors it. There will be no absorption of one association by the other, as to a very marked extent the membership of one is the same as the other. Should a union of this kind occur, a name will undoubtedly be decided upon that will identify it



PRESIDENT ARTHUR H. LOWE.

with the American industry. There is good reason for favoring the idea of making the name "American" take precedence of "National," as being more expressive of the true character and nationality of the organization, as the name "National" would be applicable to any country, while that of "American" would confine it to the United States, where it properly belongs. This was alluded to incidentally in the reply of D. A. Tompkins to the address of welcome by Mayor J. E. Reyburn.

Many millions of dollars of capital invested in cotton manufacture were represented at this Convention from all textile sections of the country, and as near as could be estimated there were fully twelve hundred persons in attendance, either as members or guests, which is the largest attendance ever reported at any meeting representing the cotton manufacturing industry.

The convention was opened by prayer from Rev. Stephen W. Dana, of Philadelphia. Mayor J. E. Reyburn extended to the members a welcome to the city, to which D. A. Tompkins replied in a few well-chosen words, in which he remarked: "It was here the nation was born, and Philadelphia has been peculiarly a national city ever since. In both education and transportation your city has always led. It is here that there is the best development of that knowledge and skill necessary to produce the finer fabrics, such as lace curtains, carpets and other superior products of the spindle and loom. It is here that there has been developed the best knowledge and skill in America in the production of both locomotives and ships. Therefore in both the realms of education and training on the one hand to make finer and better goods, and of building locomotives and ships on the other hand, to promote transportation for distribution of American goods to the people of the world, Philadelphia is the leading American city, and it is a good atmosphere for this meeting. We have heard much of the competition between New England and the South in the manufacture of cotton goods. I have always deprecated this talk as unworthy of the manufacturers of a great and progressive nation, with a world business within its reach, if its people would co-operate to get it instead of lending their efforts to petty competition at home. Our association wishes to gain the co-operation of all American cotton manufacturing interests in the work of fostering industrial education at home and of developing foreign markets abroad until the general prosperity in all America would eliminate the idea of competition at home."

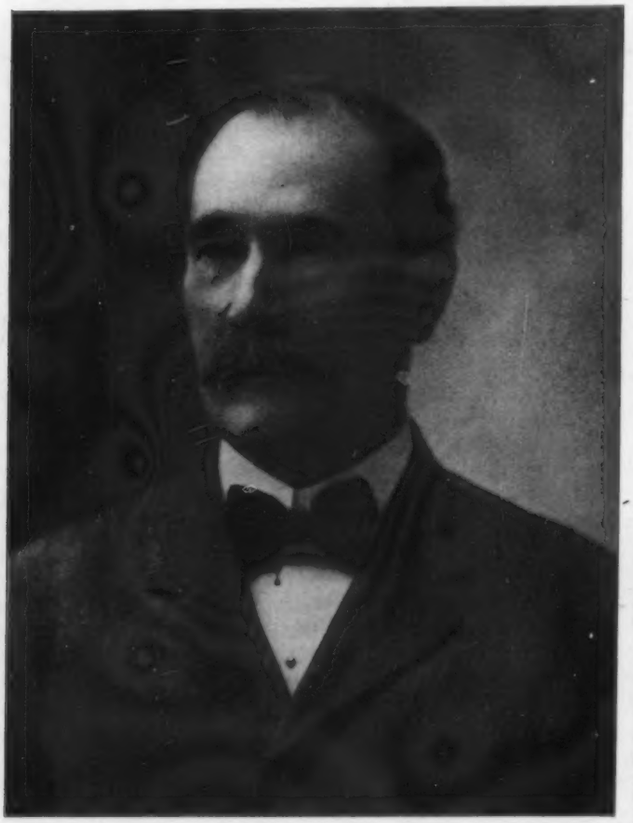
The most pleasing episode in the proceedings of the convention occurred at this point, when R. M. Miller, Jr., on behalf of the association, presented to President Arthur H. Lowe a solid silver punch bowl, properly inscribed, with gold lined cups, in recognition of the work which he had done for the Association. Mr. Miller's remarks were eloquently and feelingly given, which deeply impressed not only the receiver of the gift but all those that were present. President Lowe was visibly affected by the kind expressions which were extended to him, and replied in words of appreciation for this emblem of the generosity and good will of the members. He assured the members that he should always consider this gift as his most precious possession, an honor that he did not anticipate, and which he regarded as representing more than a personal favor to him,—one to which all of those associated with him in executive duties were equally entitled.

President Lowe now delivered his annual address (an abstract of which will be found elsewhere), followed by papers on "Immigration" by E. J. Watson, Commissioner of Immigration of South Carolina; "Qualifications of the Modern Textile Designer" by E. W. France, Director of the Philadelphia Textile School; "The Expansion of American Currency" by E. W. Robertson, President of the National Loan and Exchange Bank, Columbia, S. C.; "The Future Contract, Its Use and Abuse," by Theodore H. Price, New York; "Patents," by Geo. Otis Draper, Hopedale, Mass.; "Reinforced Concrete in Factory Construction" by Austin Tomes, Atlas Portland Cement Co., New York; "Imports and Exports of Cotton Manufacturers," by J. W. Burke, National Export Association of American Manufacturers, N. Y.; "Steam Boiler and Engine Inspection in the Modern Cot-

ton Mills" by Hugh Nelson, of the Caeualty Co. of America, New York; "American Exports of Cotton Goods" by Wm. Whittam, special representative of the United States Government, Washington, D. C.; "Proper Tagging of Cotton," by R. G. Hitt, Standard Tag Co., Atlanta, Ga., and "The Tariff on Cotton Etamines" by E. A. Hartshorne, tariff appraiser, New York.

Some of the foregoing papers were read by title only, as the time was too limited to have them read in full. Abstracts of these, however, appear elsewhere in this issue, or will do so in some subsequent issue.

The most marked features in the proceedings of the first day's session were the questions of labor and immigration, the



S. D. TANNER,
PRESIDENT OF AMERICAN COTTON MANUFACTURERS' ASSOCIATION FOR 1907-08.

lack of labor being particularly dwelt upon as militating against the needs of manufacturing, both in the mills of the North as well as in those of the South, and the great necessity of the proper kind of immigrants from European countries, especially those which can be converted into skilled help, and become permanent settlers in this country, adapting themselves to the spirit of our institutions.

Immediately succeeding the morning session, a conference was held between the following cotton men and manufacturers: George W. Bailey, William V. King and George H. McFadden, of New York, and E. A. Smyth, Charles D. Fuller, W. E. Parker, William Whitman and D. Y. Cooper, of the association. Representatives of the New Orleans Exchange failed to appear. At this meeting a protest was registered by the manufacturers against the extensive gambling in cotton which is permitted in the cotton exchanges, and the present method of grading the staple, now prevalent. They insisted that the number of grades should be reduced, believing that this will have a healthy effect upon the cotton gambling fever, and operate against frequent depression in price. The representatives of the New York Exchange stated that their exchange had already agreed to reduce the number of grades to eighteen, to go into effect the first of next year. To some extent this disposed of the grievance which the spinners had, but it was intimated at this meeting that a bill would shortly be introduced in congress providing for only eleven grades, five above middling and five below middling.

The second day of the convention opened promptly on time, with President Lowe in the chair. Previous to taking the chair, Mr. Lowe dedicated his punch bowl, the gift of the association, in a practical manner, and for which it was intended, in partaking of its contents with Wm. D. Hartshorne, President of the National Association of Cotton Manufacturers, who came from Massachusetts to be present at this Convention. Mr. Hartshorne then took a position on the platform by the side of President Lowe, and in a few remarks brought greetings from the Association which he represented.

Owing to the very limited time, the following papers were read only by title, but abstracts of them may be found in another portion of this or some subsequent issue: "A New Departure in Cooling and Humidifying Textile Mills" by W. H. Carrier of the Buffalo Forge Co., Buffalo, N. Y.; "Combed Cotton," by Jas. T. Fuller, President Fuller Combing Gin Co., Charlotte, N. C.; "The Passing of the Last Hand Operation in the Cotton Mills," by E. F. Hathaway, Boston, Mass.; "Closer Relations Between Producers and Manufacturers," by Chas. S. Barrett, President Farmers' Educational & Co-Operative Union, Atwater, Ga.

Hon. A. S. Burleson, of Austin, Texas, read his paper on "The Cotton Situation, from the Viewpoint of a Producer," followed by W. W. Finley, President of the Southern Railway Company, Washington, D. C., who read his paper on "The Relations Between the Cotton Manufacturers and the Railways."

William Whitman, President of the Whitman Mills, New Bedford, Mass., and of the Arlington Mills, Lawrence, Mass., closed the formal proceedings with a very thoughtful address on "American Business Honor," being a vigorous defense of American business ways, emphatically denying that the standards of business honor in the United States were declining.

At an executive session of the association, held immediately after the morning program, the following were elected officers for the ensuing year:

President, S. B. Tanner, Henrietta, N. C.; vice-president, T. H. Rennie, Graniteville, S. C.; secretary and treasurer, C. B. Bryant, Charlotte, N. C.; chairman board of governors, T. Ashby Blythe.

The following board of governors was elected: R. S. Reinhardt, Lincolnton, N. C.; Chas. H. Fish, Dover, N. H.; L. W. Parker, Greenville, S. C.; David Clark, Charlotte, N. C.; E. A. Smith, Charlotte, N. C.; W. T. Lang, Knoxville, Tenn.; Chas. H. Gorton, Aragon, Ga.; J. J. White, Jr., McComb City, Miss.; members of the preceding board, with the following new members: Ellison A. Smyth, Greenville, S. C.; Fred A. Flather, Boston, Mass.; D. Y. Cooper, Henderson, N. C.; E. Chappel, Atlanta, Ga.; Leonard Paulson, New York City, and M. M. McCall, Opelika, Ala.

Members New York Cotton Exchange Committee: A. R. Marsh, chairman; Samuel T. Hubbard, Geo. W. Bailey, Edward M. Weld, George McFadden.

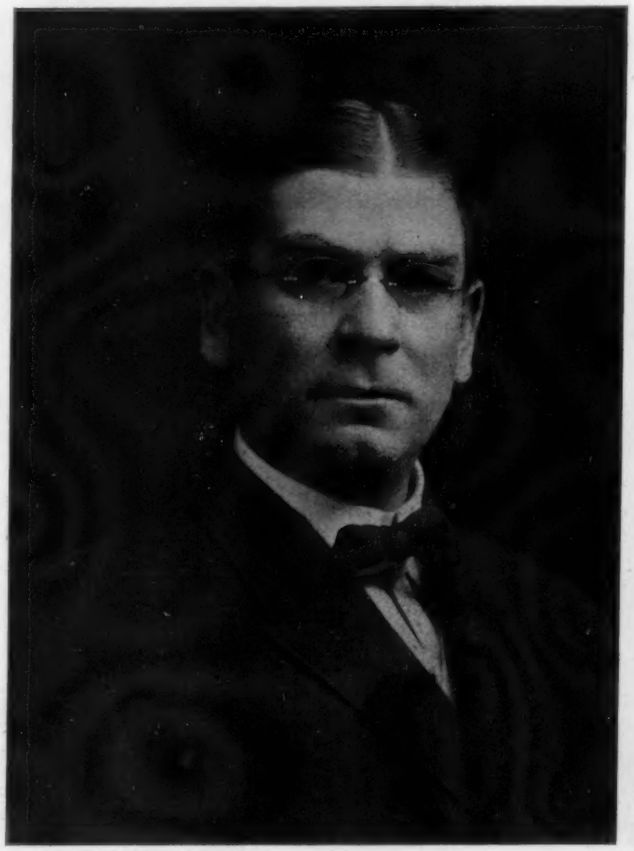
New Orleans Exchange Committee: Hon. Adolph Meyer, M. C.; A. J. Vick, W. T. Maginnis.

Producers' and Manufacturers' Committee: E. A. Smyth, Chas. C. Tuller, W. E. Parker, Wm. Whitman, D. Y. Cooper.

The following resolutions, relative to the preservation of forests, were passed:

"Whereas, The success of cotton manufacturing is largely dependent upon water power; and

"Whereas, With progressive improvements in transmission facilities, electric power generated by waterfalls already is much



T. ASHBY BLYTHE,
GENERAL CHAIRMAN OF COMMITTEES.

the cheapest and best known, and is yearly becoming more important; and

"Whereas, Electric power is dependent upon regular stream flow, which, in turn, depends upon the presence of forests at the sources of streams; and

PUNCH BOWL PRESENTED TO PRESIDENT ARTHUR H. LOWE.

"Whereas, The forests at the sources of the streams which furnish power to the cotton manufacturing industry of America, namely, in the southern Appalachian and White Mountains, are being rapidly destroyed; and

"Whereas, This forest destruction already is resulting in floods and droughts, in the silting up of streams and in the washing away of dams and mills, $18,000,000 having been destroyed in a single year, with the evile only begun; and

"Whereas, Under the present policies, old world experience eloquently testifies, irreparable ruin in a few more years will have been wrought not only to the cotton industry but to a multitude of other vast interests, public and private; and

"Whereas, The sole remedy lies in the establishment of national forest reserves in the Southern Apalachian and White Mountains. Therefore be it

"*Resolved*, First, That we again earnestly urge the immediate establishment of such reserves.

W. H. JACKSON,
CHAIRMAN OF BANQUET COMMITTEE.

"Second, That we commend the efforts already made and almost successful, and those now being made to accomplish this end; that, as heretofore, we hereby again pledge ourselves, individually and collectively, to this effort, and that we appeal to all concerned, whether as business men simply, as citizens, or as both, to employ every honorable means to insure the establishment of these reserves by the national Congress at its next session."

Everything was done on a lavish scale for the entertainment of the members of the association and their guests. "Seeing Philadelphia Cars" were run from the hotel every hour during the two days of the convention, and automobiles were run at frequent intervals between the hotel and the machinery exhibition hall. Keith's New Theatre was opened to all of the members and their guests with compliments of the Entertainment Com-

mittee. Friday following the convention was devoted mainly, in the morning, to sight-seeing in and about the city, and, in the afternoon, to a steamboat trip on the river in connection with which a complimentary shad dinner was given at the Washington Park.

THE BANQUET.

The members and their guests were entertained at a banquet at Bellevue-Stratford hotel, Wednesday evening, at which there were present men prominent in the political and industrial life of the country. This was a most elaborate function, which was given exclusively in charge of W. H. Jackson, Chairman of the Banquet Committee. The demand for banquet tickets far exceeded the capacity of the hall, which was capable of seating only eight hundred, leaving fully two hundred requests for seats necessarily uncomplied with. Some of the souvenirs of the occasion at this time were statuettes of a cotton planter standing on a bale of cotton, in an attitude of apparent independence, characteristic of his financial condition for the past two seasons.

Col. Peter H. Corr, of Taunton, Mass., was the toastmaster of the evening. Mayor J. E. Reyburn was first called upon, followed by Lieut.-Governor Robt. S. Murphy, and Eben S. Draper, Lieut.-Governor of Massachusetts. Mr. Draper was followed by Senator McLaurin of South Carolina, who quietly hinted that Vice-President Fairbanks would be the right kind of a man to succeed President Roosevelt. Vice-President Fairbanks closed the formal speaking, his address being full of reference to the greatness of the South and the world-renowned ability of its manufacturers.

The exercises were closed by the band striking up "Dixie."

THE BANQUET.
CONVENTION OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

ANNUAL ADDRESS OF PRESIDENT ARTHUR H. LOWE.

I welcome you and your friends to this the largest and best cotton convention ever held, and thank you for your interest and presence. We are especially indebted and grateful to the Philadelphia members for their unlimited generosity in time, money and service. In connection with the convention we have arranged a most unique and interesting exhibit, of the most recent devices and attachments that have been developed by the machinery builders. This is an entirely new departure and promises to be a great success. From small beginning, this splendid association with a membership of over one thousand, has been developed. The next step is a consolidation with the National Association of Cotton Manufacturers, making the largest, strongest, and most influential association of cotton manufacturers in the world. President MacColl made a most cordial suggestion looking to this end in his address to that association at their annual convention in Boston.

We gladly recognize that the textile press is one of the most important influences in the development of our industry, and the

country is fortunate in having such a strong, alert, aggressive, yet conservative and able textile press.

This association, jointly with the National Association of Cotton Manufacturers, The Southern Cotton Association and the Farmers' Educational and Co-operative Union, have arranged for a conference of the cotton manufacturers and cotton growers to be held in Atlanta, Ga., on the 7th, 8th and 9th of October of this year, to be followed by an extended trip through the cotton

LEONARD PAULSON,
CHAIRMAN OF THE FINANCE COMMITTEE.

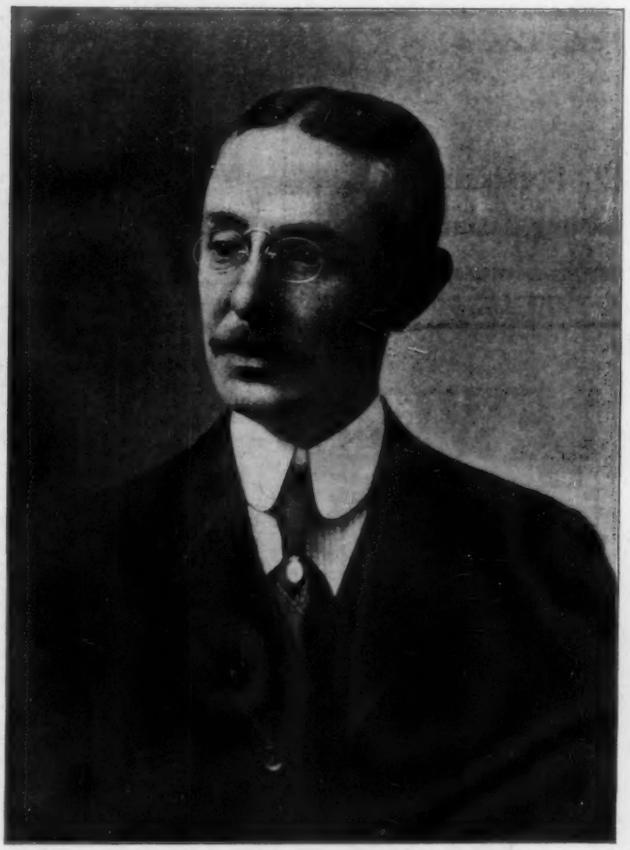
growing States. Splendid results, to both growers and manufacturers, are expected from this conference.

There is no field in human activity that affords more opportunity and imposes more responsibility than is put upon the cotton manufacturer. It is his business to clothe the people. He assumes the responsibility of a very intricate and trying business. The highest type of business ability is required. He must be an expert upon questions of tariff, finance, transportation, rates of exchange, immigration, insurance, prices of cotton, value of, and operation of machinery, labor conditions, market conditions for goods, coal, supplies, etc. He assumes the responsibilty and welfare of his employees, he must be their main-stay; he must give them employment and wages, he must have a care for their health, happiness, education, even religion; he must take an interest in their trials, ambitions, successes and failures. Many manufacturers have charge of every detail of a small city. They must provide houses, streets, sewers, sidewalks, water supply, lights, schools, churches, stores, hospitals, parks, play-grounds, entertainments, etc. Everything to be found in a thriving, up-to-date municipality, except the poor house and jail; I have never seen neither of these in any mill village.

At the present time we are in the midst of an unusual activity in cotton manufacturing. It is easier to make sales than to make deliveries. In fact, the whole country is in a prosperous condition, and it will continue to be so, so long as the great crops and the enormous output of gold continues. Practically the only complaint in the country today is the shortage of the labor supply, the whole country needs labor in every enterprise, both field and factory; this is especially true in the South. It is to be regretted that the honest efforts made in perfect good faith by some of the cotton manufacturers, members of this association, to divert the flow of immigrants from the cities where they are not wanted, to the South, where there is a crying need, should have offered opportunity to the Government officials at the behest of the labor organizations, to prosecute the manufacturers.

The labor situation is the most important problem before the cotton manufacturers today. The shortage of labor in the North is about equal to the shortage in the South, from all the data that I am able to obtain, and the shortage of labor, in our industry, in this country, is so great that cotton mill building is almost at a stand-still compared with what it is in England.

The future growth and magnitude of cotton manufacturing in the South will depend largely upon the number of immigrants that can be obtained for cotton mill work. The native American



E. B. BOGARDUS,
CHAIRMAN OF ENTERTAINMENT COMMITTEE.

will drift to other industries—that he will—is the experience of the New England mills.

The most needed and next great railroad development in this country should be in the South. The products for transportation in the South are bulky and heavy. Within five years a cotton crop of 16,000,000 bales will be required and grown in

the South. The railroad facilities required to transport such a crop together with the iron and steel, the coal and coke, the lime and cement, the lumber, the produce and fruit crops, will be enormous.

In future, everything possible must be done to get new help, make the work in cotton mills attractive in comparison with other employments. Good comparative wages must be paid, and manufacturers must do everything possible for the health, comfort and welfare of the employees. Remove the erroneous prejudice against cotton mill work. Make the mill attractive. Make the work attractive, make the village attractive, make all the conditions and surroundings healthful both morally and physically.

Every effort to increase the quantity and improve the quality of the cotton produced in this country should be supported. Every effort to develop cotton manufacturing in this country should be encouraged. Every effort to open the foreign markets to our cotton manufacturers should be encouraged. Every effort to develop an American merchant marine to carry the products and manufactures of our country to foreign markets should be encouraged. Every effort to preserve the forests that protect the water sheds that furnish the power to drive the spindles and looms of our mills should be supported.

THE QUALIFICATIONS OF THE MODERN TEXTILE DESIGNER.

By E. W. FRANCE, PHILADELPHIA.

The ingenuity of our modern inventors and the capacity of our organizers and administrators has been so great, that throughout many of the branches of the cotton industry, automatic and semi-automatic machinery and manufacturing methods, based upon the use of such machinery, have reduced to a minimum the responsibility of the man for the product he has in hand to produce. To such an extent has this become a fact that the most common-place kind of labor, indeed I may say, the most ignorant class of common labor is now being accepted in some of our cotton manufacturing centers. In fact, a very large part of the operatives to be found in our New England cotton mills today are recruiting from such immigrant classes as the Armenians, Portuguese, Russian Jews, Poles, etc., practically uneducated and devoid of any previous training, and while this labor can be taught to perform the various functions of machine tending, it cannot, without further education and opportunity to study the underlying principles involved, be expected to do, or become, any more than a part of the machine itself. Our modern factory system does not, and cannot, permit of a schooling along this line. The keen competition of the day demands that the efforts of every employee shall be concentrated on the part of the work he or she was engaged to perform, leaving no opportunities for an acquaintance with preceding or succeeding operations. The tendency of all this is a marked narrowness in the workman; a lack of appreciation, so to speak, of the good or bad qualities of the product he is handling. Moreover, this narrowing influence of such minute specialization is fast becoming a most serious matter to the future welfare of the industry. Manufacturers are recognizing more and more every day that it is causing the untrained workman to think almost exclusively of his wages, and to be satisfied with his position so long as he has work.

And where shall we look for our men who are to create our new fabrics—our new designs and colorings? Surely, we cannot expect to find them among the ranks of those just mentioned, who have had no training other than that of machine tender, and whose tastes are, as a rule, the most unrefined. To me there is but one answer to these questions—namely: that it is the well-organized textile school we must look, for not only our trained managers of the future, but particularly for our designers, the men who create our styles and colorings, our new creations, etc. It is upon the shoulders of these men that the responsibility for success in the effort shall rest more than any other factor. It has not been so considered in the past, but I predict that it is bound to be so in the future. That the textile school will be an absolute necessity to the future of the industry, I have not the slightest doubt. No other agency can so well supply this needed efficiency. To my mind the textile school of the future will stand in the same relation to the industry as the West Point Military Academy does to the army, or Annapolis does to the navy.

If we expect to win our way to the highest kind of success in textile productions we must build better in the future than we have done in the past; we must recognize our weakness in this direction and make every possible provision to correct it. It must be frankly admitted that our foreign competitor has at present all our economic appliances, and is able to meet us man

E. W. FRANCE.

to man, or machine to machine, on a common ground, but he has in addition a something which we as a nation have systematically neglected, and that he has skilled craftsmen artistically trained in all branches of textile production. The foreign manufacturer has watched our wonderful mechanical progress and has set himself to surpass us on more profitable lines. After a little careful study, however, it was apparent to him, that quality rather than quantity was, after all, the chief factor in the problem, and to attain success in this direction it was recognized as indispensable that not only the working classes, but the manufacturers as well, must be educated to higher and finer standards of taste than ever before.

It is undoubtedly the nation which possesses the most skill which will win in the race; the country which expects, or deserves, to make fabrics which will find a ready sale in the world's markets, must see that her citizens engaged in the manufacture of such goods, not only possess a knowledge of the minutest details of operation, but that they also have in addition to this a training which will supply that refining influence of culture

and taste which is so essential and so indispensable to all high-class productions.

Technical education in textiles means the embodiment of all instruction in both practice and theory, which may practically be included in the requirements of a good, sightly and salable article, whether it be of cotton, wool, worsted or silk. What the student of higher textiles should be taught is not only what the apprentice should be taught in the mill, to do actual things and to produce actual stuffs, but hand in hand with this instruction must go all the necessary information required for these productions, from the raw to the finished state, not omitting a thorough training along the artistic as well as the commercial side, which

T. H. RENNIE,
VICE-PRESIDENT.

stands for the money value of the products produced. In addition he must make a thorough study of chemistry, dyeing, bleaching and finishing, so that he may be able to judge from the finished fabric the needs of the fabric in all its ramifications back to the raw materials required in its production. This, briefly speaking, is the A-B-C's or fundamental knowledge required for our modern textile designer, and no one part of this education can be neglected, and least of all the artistic side, the side in which the color and design play so important a part.

It is not, as you well know, the intrinsic value of an article alone that makes it salable—far from it. Its first requisite must be that it is attractive—it must have snap in color as well as design. Indeed, it is more upon this art side of the problem that our needs are most apparent today. It is the artistic element that constitutes the charm of all textile productions, and enables the good goods, and those which may not be quite so good, to hold the market. No amount of cheapening process, however, can compensate for the absence of this quality, and no amount of purely mechanical skill can supply this want. It is time for the truth to be spoken upon this point. We have been strangely backward in learning this lesson. Color, as well as design, must undoubtedly form one of the fundamental requisites to the knowledge of all successful designers. It is undoubtedly a study of the utmost value to the student of textiles; in fact, I might say, it is one of the most important and yet one of the most neglected in many of our schools.

I am distinctly aware that originality is one of the rarest things on earth, and that no amount of education can produce it; at the same time, I am positively certain that the brain which has been well trained along the line of textile work is the only one which is fitted to cope with the problem by which the modern manufacturer is confronted.

It is putting it mildly to say that manufacturers have not yet realized the extent of either their responsibility or their opportunity in this matter. Without the sympathetic co-operation and support of practical men technical education must miss a large part of its meaning, and fail of accomplishing a large part of its purpose. The educator, as such, is doing all he can. He is reaching out and trying, earnestly and persistently, to adapt his methods to practical aims. He is introducing into the school room every kind of tool and appliance that can be made to serve an educational purpose from his point of view, but there are obvious limits to his power to render the kind of service which the industrial situation demands. The teacher will do all he can, but the manufacturer must help.

THE FUTURE CONTRACT, ITS USE AND ABUSE.

BY THEODORE H. PRICE.

I may briefly refer to the action I have taken with regard to the New York Cotton Exchange. I asked for and secured an injunction, which demanded in specific terms that they should obey their own rules, by-laws, the laws of the State of New York and of the United States.

The Exchange has during the past year or two been subject to much criticism. This criticism has resulted in the enactment of statutes in many Southern States which practically put transactions on the New York Cotton Exchange under the ban of illegality. Under such conditions there have appeared for the Exchange two apologists. Mr. S. T. Hubbard, a former president of the Exchange, and a brother of the present president, delivered recently in Boston an address in defense of the Exchange. The gist of Mr. Hubbard's argument is "if you buy at a discount you can sell at a discount," and that the great advantage of the fixed differences between grades which prevail in New York is that "if you receive cotton at one valuation you wish that valuation to remain permanent until you redeliver it or sell it." Another statement made by Mr. Hubbard is as follows: "The cotton merchants of New York have maintained and increased their dominant position in the world's markets by offering to the cotton trade the same standard of classification since 1886, from which the other markets have departed."

This latter statement of Mr. Hubbard's I most emphatically challenge, and am in a position to prove that the standard of classification which now exists in the New York market is not the same as that of 1886, but one considerably debased as compared with that of 1886. It is one of my chief contentions that this standard should have been maintained and that it has not been so maintained. This, however, is a detail. Let us consider, first, the question of the so-called "fixed differences."

These differences are fixed in November for a period of ten months, and in the succeeding September for a period of two months. Just why the year was thus sub-divided I have never been able to understand. The character of the crop can not be known in September, and it is but little better known in November. The past year's experience has shown that the

grade differences established by the law of supply and demand in November were very much wider than those established by the law of supply and demand in February, and this is one reason why the New York contract has depreciated relatively, as compared with the value of real cotton. But let us consider the basic principle underlying the right of the Exchange to fix differences for a period of ten months. The advantages of such an arrangement are not apparent to me. Is it legal? Has the Exchange any more right to say that good ordinary cotton shall be worth within 125 points of mddling cotton for a period of ten months than it has to say that middling cotton itself shall be worth 12c a pound for a period of ten months? Good ordinary cotton and middling cotton are, as has been proved by this

VAL TAYLOR,
MEMBER BOARD OF GOVERNORS.

year's experience, things differing widely from each other both in value and availability. In my opinion the action of the Cotton Exchange in attempting legally to compel delivery of good ordinary cotton on the basis of middling contract at a fixed difference for a period of ten months is about as illogical as it would be for the Chicago Board of Trade to say that for a period of ten months a contract of 5,000 bushels of wheat may be liquidated by the delivery of 5,000 bushels of corn at a price 50c a bushel less than that at which the contract for the wheat was entered into. There is no more reason why those who trade in New York contracts should be protected against the legitimate fluctuation in the value of the different grades than that they should be protected in the value of the basic grade itself, i. e., middling. Not only is the practice without reasonableness, but it has worked, is working, and will continue to work, the greatest possible harm to the New York Cotton Exchange if it be not speedily abandoned. The spinner sells his goods for delivery during January, 1908. He desires to protect himself against any radical fluctuations in the market for the raw material. The past year's experience has shown that the New York contract affords no protection. It has declined largely as a result of these fixed differences, while the price of cotton, which the spinner required has advanced. If the differences between grades, month by month, or week by week, had been co-ordinated to the actual value of the respective grades the New York contract would have continued to maintain, as have the Liverpool and New Orleans contracts, some just relation to the price of all grades of cotton.

A planter desires in July to sell against his prospective crop of January contracts in New York, and if in November, through a mistake, either in judgment or intention on the part of the Revision Committee, the differences on the high-grade cotton were made unduly narrow, and the farmer produced these high-grade cottons, the result would be that the New York contract, which the farmer had sold, would relatively advance, as compared with the value of spot cotton in the South, and the farmer would be forced to sell his cotton in the Southern market at a price perchance considerably less than the just equvalent of the basis, which he assumed he had obtained when making the original transaction.

The truth is, that the attempt to fix the differences between the grades, whether it be for a period of ten months or six months, is an effort to set aside the operation of the law of supply and demand, and as such must work injustice and result to the ultimate injury of all concerned. If a mistake be made in fixing these differences it is irrevocable. If conditions change so that it is apparent that the differences are wrong, it is impracticable to correct them, and the result is that the New York contract has largely ceased to be availed of by the trade itself for any legitimate purposes of protection and has been relegated by statutory enactment in many of the Southern States to the category of those things which may be described as gambling, rather than business, even though business involves, as it must always, more or less speculation.

PATENTS AND INVENTIONS.

BY GEORGE OTIS DRAPER, HOPEDALE, MASS.

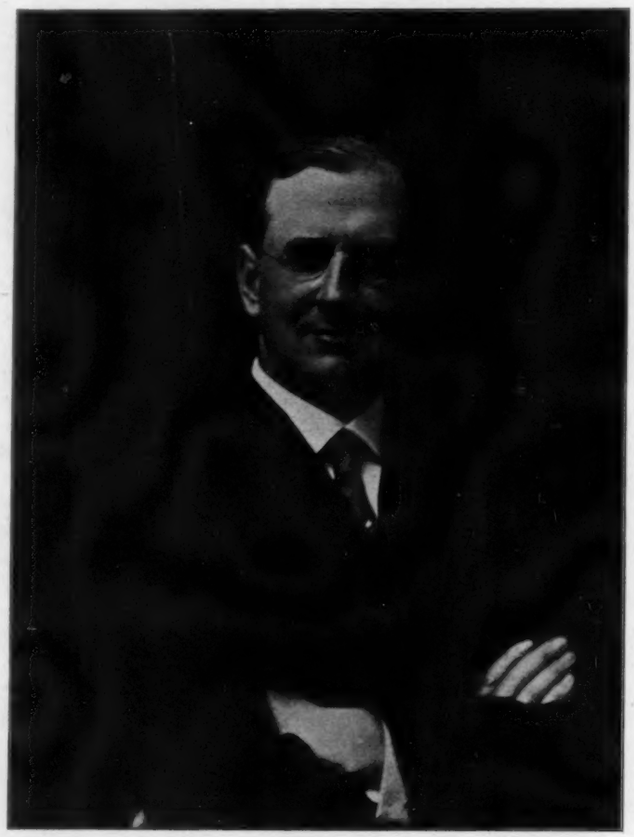
The great majority of patents are taken out by individuals in the hope of profiting by royalty charges or sale to other individuals or corporations, for the average inventor has not sufficient capital to manufacture and introduce his invention himself. The patents that are retained by the inventors rarely produce any profit at all. While a great number of patents are acquired by corporations, it is really surprising how few corporations make a specialty of patent purchase, and how few patents are purchased compared with the number issued. Recent investigation seemed to show that the Draper Company, with which I am connected, was acquiring more patents per year than any other individual or corporate organization, outside the electrical field.

The introducer of a patented improvement not only has to encounter the competition of infringers, but he has to overcome the prejudices of the possible purchasers. The average man does not like to change a process or a machine that he is used to, any more than he likes to change the style of his clothing or the hours of his meals. He can be convinced of the necessity for change if there be sufficient proof of a profit; but his help also dislike to change their habits, and they are not so sure of sharing in the profit. Many a good idea is killed because the operatives will not assist in getting possible results from new machinery, and the very operatives who have become efficient by long practice, with the old machinery, are less likely to encourage adoption of the new ideas.

Certain manufacturers are hindered in the adoption of labor-

saving machinery, by the antagonism of their help. Organized labor is often opposed to labor-saving improvements because it believes that such machinery increases the numbers of the unemployed. The fallacy in this line of reasoning has been too often exposed to need attention here, but the proof does not always reach those effected by the proof.

The profitable inventions are nearly all simple in character; and successful simplicity illustrates a much higher order of mind than do complex devices performing the same purpose. The great artist produces desired effects with a few suggestive strokes. The great author condenses thoughts into few words. The Rabbeth spindle, the most marked improvement



GEORGE OTIS DRAPER.

in its line, depends on novelty for the mere substitution of a loosely held bearing for a tight one. The Sherman spindle, which made a distinct advance in the art, simply substituted a metal contact for the Rabbeth fibrous packing. The popular Draper spindle combined the advantages of the Sherman metal contact at the top of the bolster, with the fibrous packing at the lower end. The greatest royalty ever received by a spindle inventor, was given for a mechanical device to prevent a loose bolster from turning, though any mechanic could devise a dozen such mechanisms, after the need for such an invention was obvious. It took twenty-four years for one to discover that two rows of temple teeth on the old horizontal wheel temple were better than one row. The idea of making a spinning ring reversible controlled that particular art for years. Spinning rings were strained out of true in hardening for fifty years or more before one thought of hardening them on a round plug. The Northrop loom depends fundamentally on the grasp of a ridge by grooves in a spring, and the placing of a self-threading shuttle eye in position to allow the thread to be drawn into place by the motion of the shuttle.

While logical inventions are usually made by practical men in constant touch with the machinery perfected, the revolutionary changes are often brought about by men who are not experienced in either seeing or handling the machines that they improve. Dr. Cartwright, who invented the power loom, had not even seen a hand loom when applying for his first patent, though he made several marked improvements later by adapting some of the hand loom devices to his own construction. Most of the Northrop loom inventions were devised by men whose experience with looms was very limited. The inventions made by men lacking practical experience in the running of the machines to which their inventions are applied, must be modified by practical men in the majority of instances, before they are fit for commercial use. It is usually advisable to have inventors carefully advised by practical men during the development of their ideas. This was well illustrated by an attempt to develop an idea at long range, in our earlier loom experimenting, when a most ingenious and highly educated designer worked for three years in his own shops, to develop a mechanism which we needed. His inventions were covered by ten patents; but not one of them ever went into practical use, and the ten patents have not apparently related in any way to any of the mechanisms which have gone into use. Other inventors, more in touch with the practical necessities, invented the necessary devices at short notice, when the problem was turned over to them.

The risk in development and introduction of inventions is well illustrated by the scarcity of corporations engaged in the business. There are so many chances for loss that the profits are few and far between. No one knows when purchasing or developing an idea, that there may not be some patent application already in the Patent Office which covers the same. The public does not know any of the facts regarding such patent applications. We were once made liable by the issue of a patent nine years after its application, and we had been manufacturing the infringing device made under a patent of our own granted much earlier. We had to compromise with the owners of the new patent, since it antedated ours; in fact, we had to buy the right of use at a very substantial figure.

The profits of patented machinery are often greatly exaggerated. The first patent spindles produced no profit at the price sold, until machinery was developed which could produce them economically. Some of the machinery that starts off with a good margin between price and cost is gradually made more expensive by continued improvements and additions, while the base price remains the same. I could easily refer to machinery wholly unprotected by patents, which often sells with a higher margin of profit than some of the most carefully protected types, because there is a chance for profit in making a standard trade machine that has no element of change to consider, and where the multiplied duplication allows use of the most economical processes.

REINFORCED CONCRETE IN FACTORY CONSTRUCTION.

BY P. AUSTIN TOMES, NEW YORK.

I have prepared a short paper on re-inforced concrete in factory construction—a subject that should be carefully investigated by any manufacturer who contemplates building.

Many types of buildings have been advanced to meet some or all requirements from the old masonry mill to the modern slow burning mill construction of the steel frame hollow tile factory, but until a few years ago when the wonderful qualities of con-

crete were fully demonstrated, no satisfactory solution of the problem had been found.

About forty years ago a French gardener, Joseph Monier, first conceived the idea of embedding metal in concrete in an endeavor to lessen the thickness of some flower pots he was making, and from this simple beginning, by slow stages and after much experimenting, the great system of reinforced concrete has evolved.

While it is true that reinforced concrete is less than half a century old, it must be remembered that concrete construction was used extensively during the construction period of the Roman Empire, and although their cement was of quality much inferior to the high-grade Portland cement of today, much of the work done then is in an excellent state of preservation—a silent witness to the indestructibility of this material.

For the information of those who have not studied the subject, let me say that ideal concrete (artificial stone) is made from a mixture of broken granite, trap rock or clean screened

P. AUSTIN TOMES.

gravel, size varying from a walnut to a hen's egg, clean coarse sand and first-class Portland cement in such proportions that the voids between the stones will be filled with sand and the voids between the grains of sand filled with Portland cement, slightly in excess of the quantity necessary to fill said voids, in order to furnish additional adhesive properties to thoroughly combine the sand with the broken stone. To this, sufficient water is added to act upon the chemical qualities contained in the cement. The whole, after sufficient time has elapsed to give the cement time to set, forms a solid stone (monolith).

Reinforced concrete is ordinary concrete in which iron or steel rods or wire are embedded. Reinforcement is required when the concrete is liable to be pulled or bent, as in beams, floors, posts, walls or tanks, because while concrete is as strong as stone masonry, neither of these materials has nearly so much strength in tension as in compression. Moreover, concrete alone like any natural stone, is brittle, but by embedding it in steel rods or other reinforcement, the cement adheres, and the metal binds the particles together so that the reinforced concrete is better adapted to withstand jar and impact. Even railway bridges are built, not only in arch form, like a stone arch, but in some cases like a steel girder bridge, with a flat reinforced concrete floor supported by horizontal beams of the same material.

Concrete requires only such material as is easily obtainable, the sand and gravel or broken stone being local products, while cement and such steel as may be required for reinforcement can be had on comparatively short notice.

For a building designed to contain heavy or fast running machinery, concrete is especially well adapted, the monolithic nature of the structure and the density and compactness of the material deadening and absorbing the vibrations in a way impossible in steel or wooden structures.

Another quality of concrete, with which most of you are familiar, is the absence of danger from corrosion, rust and decay. Steel, when embedded in concrete, will not rust or deteriorate, and the up-keep of this class of buildings is practically nothing. Concrete needs no painting.

The impermeability of concrete is another factor that should be reckoned with. This prevents, to a great extent, the damage caused by water seeping through the floors and the consequent damage to the contents of the floors below.

The insurance on concrete buildings is very low and this, taken in connection with the immense saving due to uninterrupted business when a fire occurs, makes this class of building particularly desirable.

IMPORTS AND EXPORTS OF COTTON MANUFACTURES.

BY JAMES W. BURKE.

As representing the National Export Association of American Manufacturers, of recent formation, I desire to express my appreciation of the privilege of addressing your thoroughly representative body.

It is my intention to point out certain defects in our present export methods, which will have to be remedied before we can occupy in the world's markets for cotton goods the place to which we are entitled, as growing 80 per cent of the total supply of raw cotton. Today, as you know, we only furnish 5 per cent of the world's exports of cotton goods, or about 8 per cent of the amount shipped by England.

The English or German manufacturer sells direct to his foreign customers in his own name, thus creating a personal interest between maker and consumer. His sales are made through his accredited agents in foreign markets, whose commission figures as part of the cost, so that the buyers abroad are offered European goods at mill selling prices.

The facilities of bank guarantees at the disposal of European manufacturers far excel those hitherto available to American makers. By the intervention of European banks the foreign manufacturer can get his money without incuring further risk, while his customer abroad is allowed the term of credit to which he is entitled according to the mercantile usages of his market.

The principal cause of these unsatisfactory export conditions lies in the fact that our manufacturers have not been in direct contact with the European markets, where the battle of competition is fought and whence the financial arrangements of the world's cotton goods trade are controlled.

It is to a great extent by cultivating personal relations with the European partners and traveling buyers of oversea houses that European cotton manufacturers have secured and retained a hold upon the trade of the world.

For the needed increase in our exports of cotton goods we must evidently look in a great measure to the South, but to arrive at the end in view, direct representation in foreign markets and improved shipping facilities from Southern ports are essential requirements. Nothing short of combined effort on the part of our manufacturers will remove the existing obstacles to the natural development of our exports of cotton manufactures. Only collective action abroad can ensure results.

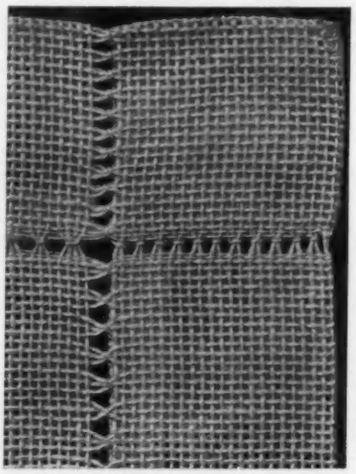
There are one billion and a half people in the world, most of whom have yet to become acquainted with the merits of our cotton goods. There is, therefore, practically no limit to the possibilities of export trade for the American cotton manufacturer when properly guided.

THE GERMAN AND AMERICAN TARIFFS ON ETAMINES.

BY EDWIN A. HARTSHORN.

The tariff laws of both Germany and the United States are designed to be protective in character. Each nation imposes upon open-woven, transparent, or semi-transparent, cotton tissues, a duty amounting to nearly double that placed upon close-woven fabrics.

The German tariff imposes a duty of 80 marks per 100 kilo-

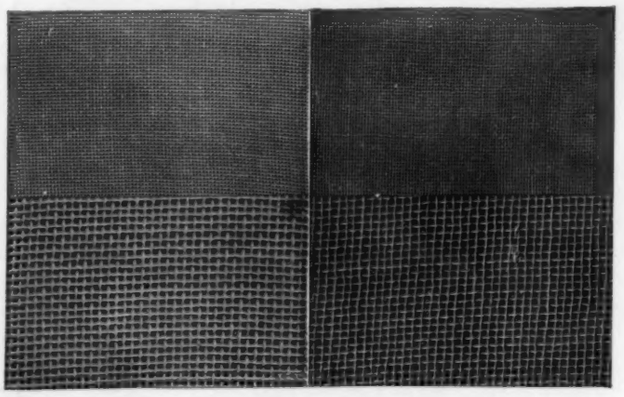


A CORNER OF ETAMINE "ARTICLE," DUTIABLE AT 25 PER CENT, AND MADE FROM ETAMINE DUTIABLE AT 60 PER CENT.

grams upon "close-woven (cotton) tissues"; 120 marks per 100 kilograms upon "open (cotton) tissues"; 200 marks per 100 kilograms upon all "transparent (cotton) tissues"; and 230 marks per 100 kilograms upon (cotton) "tissues for curtains."

The American tariff imposes a duty of from 25 to 40 per cent ad valorem on plain, close-woven cotton cloth of various descriptions, and a duty of 60 per cent ad valoren upon cotton "etamines," "vitrages," "veils and veilings."

ETAMINE REDUCED. VOILE.



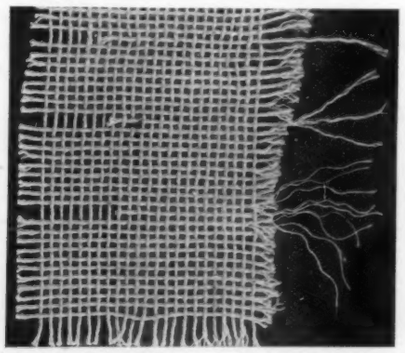
Etamine, Dutiable at 60 per cent. Voile Enlarged, Dutiable at 25 per cent.

ETAMINES AND VOILES IDENTICAL IN CONSTRUCTION.

Germany is sufficiently patriotic to execute her tariff law as enacted by the people; and keen enough to send to the United States her "etamines," "vitrages" and "veilings" at rates specified for close-woven tissues, equivalent to about half the rates specified in our tariff as it was enacted by the people.

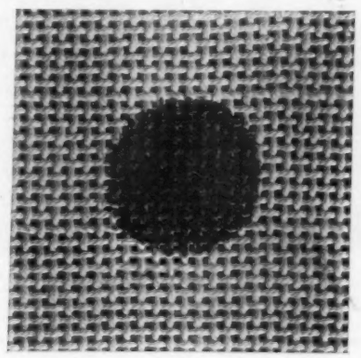
This method of administration gives Germany not only an absolute monopoly of open cotton tissues in her own markets, but practically a monopoly of the American markets as well.

Is it that the German people are more fortunate than the Americans in describing cotton cloth, or are their customs officials more patriotic in the administration of their law? The terms "open tissues" and "close-woven" tissues are certainly no more descriptive of cotton woven fabrics than are cotton "cloth," cotton "etamines" and cotton "vitrages." The latter words have been in commercial and descriptive use in connection with open-woven fabrics for at least a generation. In fact, nearly all French commercial terms are descriptive of the merchandise



ETAMINE, SHOWING CABLE THREAD, STRANDS AND SINGLE YARNS.

which they denote. The term "etamines" can mean nothing but sieve cloths; "vitrages," in a cloth schedule, can mean only transparent or semi-transparent fabrics so woven as to admit light and to be thus fitted for use about glass windows which they resemble. As a matter of fact, no single words are more specific, commercially or descriptively, than those employed in our own tariff to describe various cotton fabrics. Nevertheless, those



ETAMINE.

WHITE OR ECRU, 60 PER CENT. COLORED (CENTER), 30 PER CENT, AS CONSTRUED BY BOARD OF GENERAL APPRAISERS.

who have been engaged in re-writing our tariff downward—without legislation or the guidance of the testimony of practical business men—are constant and vehement in criticising its construction.

The contention of importers and certain customs officials that the merchandise in controversy was unknown at, and prior to, the enactment of our present tariff law, was not only without foundation in fact, but it was irrelevant, even if true, in view of certain unreversed decisions of the United States Supreme Court, which holds that "The fact that at the date of the passage of an act imposing duties, goods of a certain kind had not been manufactured, does not withdraw them from the class to which they belong, when the language of the statute clearly and fairly includes them."

The cases under consideration fairly illustrate the usual tactics of certain attorneys for importers. The plan is to delay the settlement of rate controversies until a vast amount of money has accumulated in the United States treasury. Then, if the importers win, the customs attorneys, as a general rule, retain one-half of the sum recovered.

In the first etamine case, four witnesses testified for the importers before the board of general appraisers. The testimony of these witnesses, by reason of its contradictory and evasive character, as an entirety, failed to controvert the government's contentions. Five government witnesses followed, who testified without an important contradiction or suggestion of evasion, overwhelmingly sustaining every contention of the government.

WM. T. LANG,
MEMBER BOARD OF GOVERNORS.

Nevertheless, upon this record and testimony the board of general appraisers decided that open-woven cotton "etamines" and "vitrages," and articles made therefrom for curtain purposes, are close-woven cotton cloth, dutiable at little more than half the rate specified in the tariff as enacted.

The same decision also found that all open-woven flax etamines and vitrages, for whatsoever use intended, are dutiable at the lower rates specified for close-woven flax fabrics.

For the alleged reason that this decision was "vague and unsatisfactory, in that it gave no safeguard for future classification," the Treasury Department directed the Collector of Customs at New York to take an appeal therefrom. This appeal, though taken, was finally withdrawn by direction of the Department after several months of investigation.

Thus the tariff was re-written, and, as stated in a later decision, "reliquidation of a vast amount of merchandise" followed. In plain language, this means that there was taken from the United States Treasury a vast amount of money, one-half of which fell into the hands of those instrumental in obtaining this decision.

The decision itself explains why cotton etamines and veilings designed for dress goods were found to be dutiable at 60 per cent in the following words:

"As to these goods, the return of the appraisers is that they are etamines, and the importer introduced no competent testimony showing any other trade designation as to the particular merchandise, and there is therefore no testimony in the record rebutting the return of the appraiser, which under the circumstances is controlling."

The importers, however, were soon thereafter afforded an opportunity to produce abundant evidence of the desired character, without the slightest fear of contradiction by government witnesses.

In order to demonstrate beyond the shadow of a doubt that the appraiser and the collector of customs had made a stupid judicial blunder in their classification of open-woven cotton fabrics, a new case was decided upon.

Several hearings on various dates were set for testimony as to the commercial meaning of "etamine," "vitrage," "veiling," and other terms applied to open-woven cotton fabrics. Of these hearings no notice was given, and therefore no opportunity whatever afforded the appraiser of producing witnesses to testify for the government.

At one of these hearings—as the record shows—and the decision of the general appraisers itself confirms the record—

"Counsel for certain importers moved that the record and testimony in T. D. 25580 be made a part of this record." Said motion was granted, and the board of its own motion consolidates the records above enumerated with that last above given."

It should also be stated that at the final hearing the counsel for the government recalled one of the four witnesses for the importers in the former etamine case. The further testimony of this witness was in part exceedingly erroneous, and therefore quite unfavorable to the government. All the witnesses in the new case, with this single exception, solemnly swore that they had bought or sold open-woven cloth for many years, but that in their entire business experience they had never heard the goods called etamine.

Upon this record and testimony the board of general appraisers found that all open-woven cotton fabrics—with the single exception of embroidery foundations, white or ecru—are dutiable as close-woven fabrics; also that all articles made from embroidery etamine, white or ecru—which in the piece is dutiable at 60 per cent—are close-woven cotton cloth, dutiable at only 25 per cent.

With the acquiescence of the department in this decision, there followed as a matter of course further reliquidation of vast quantities of merchandise, resulting in the withdrawal from the United States treasury of a vast amount of money to fill the coffers of those favored by the decision.

By this decision, the tariff was again rewritten, so that, as compared with the merchandise originally subjected to a duty of 60 per cent, what was left so dutiable (embroidery foundations white or ecru) was very little indeed.

Nevertheless, the importers and their attorneys were not satisfied even yet; for they immediately carried the case to the United States Circuit court, where they produced additional "never-heard-of-etamine" witnesses, and then rested their case.

If the case had been submitted to the court upon this record and testimony, embroidery foundations would undoubtedly have been found dutiable as a close-woven "twenty-five per cent" proposition, and more money would thus have been taken out of the treasury.

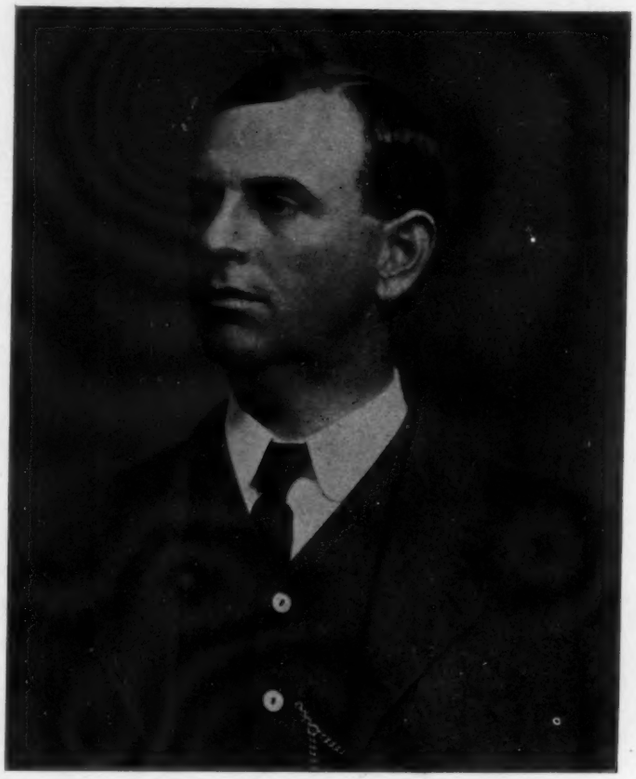
In the court proceedings, however, the government was fortunately permitted to produce additional testimony, establishing by twenty-two irreproachable and unimpeachable witnesses the

following facts and principles:

First. That prior to the enactment of the present tariff the words "etamines," "vitrages" and "veilings" were in common commercial use in Europe and America to designate and describe certain open-woven cotton fabrics.

Second. That these words were applied to curtain, dress, and other goods in all colors, of whatsoever fibres composed, as well as to cloth for embroidery foundations.

Third. That the duty upon the diminutive cables from which cotton etamines are woven, it greater than the duty found by the general appraisers to be applicable to all cloth woven from the yarn (excepting only embroidery foundations), a condition of affairs which of course renders absolutely impossible, except at a loss, the manufacture of etamines in the United States.



W. C. HEATH,
MEMBER BOARD OF GOVERNORS.

Fourth. That certain importers, whose witnesses swore they had never heard of etamines, were at that very date labeling their imported and domestic etamines as such; and there were put in evidence the importers' own labels with the word etamine thereon!

Fifth. It was shown by documentary evidence that the United States patent office had refused, prior to the enactment of the present tariff, to register the word "etamine" as a trade-mark, for the reason that the word was at that time "descriptive of certain merchandise and was common property."

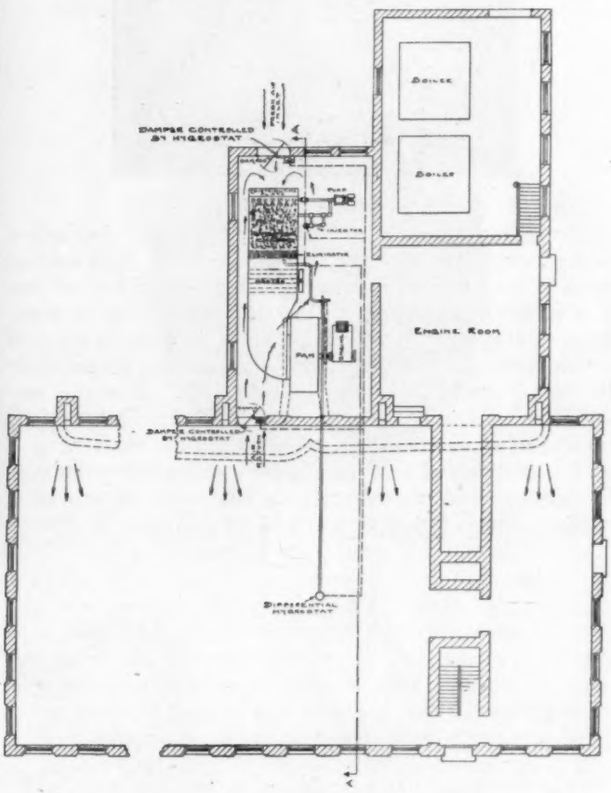
Sixth. By a single New England manufacturing concern there were put in evidence tissue press-copies of 4,000 invoices sent out prior to the enactment of the present tariff during a period of less than 5 months. These showed that over 600 of the 4,000 invoices specified cotton etamine dress goods by number and by name, and that the goods had been shipped to nearly 100 different American dry goods houses, scattered from Maine to California, and from Canada to the Gulf of Mexico!

Seventh. That prior to the writing of the word "etamines" in our tariff law, etamine labels were printed by a single New York printing establishment in lots of 50,000 for the use of a single dry goods house! Further, that the total number of labels printed for its various customers by this one establishment and used to ticket many millions of yards of cotton etamines, by far the largest part was used upon dress—and curtain goods.

A NEW DEPARTURE IN COOLING AND HUMIDIFYING TEXTILE MILLS.

BY W. H. CARRIER, BUFFALO, N. Y.

The subject of cotton conditioning is one of vital interest to the operators. The effect of climatic conditions upon the various processes in textile industry, particularly in the spinning and weaving of cotton, has long been known and is well understood by all mill operators. Every cotton mill superintendent is familiar with the fact that the cool moist days of the spring and fall enable him to produce a stronger yarn and an increased output. He also knows that the hot dry weather of summer and the cold dry weather in winter without artificial means of mill



FIRST FLOOR PLAN.

conditioning reduces the output both in quantity and quality. Owing to this variability, it is impracticable to speed many of the machines, particularly the spinning frames, to the maximum under which they could be driven under ideal conditions. For these reasons the natural, cool, moist climate of England, with its great uniformity of conditions, is unrivaled for textile industries. On the other hand, the natural, dry, hot climate in the South is very unfavorable and practically prohibits the spinning of fine yarns unless some artificial means is employed to counteract the natural conditions.

It is the purpose of this paper to show both the scientific principles applying to the artificial conditioning of cotton mills,

and to describe a system of conditioning which the writer believes embodies such principles most effectually.

IDEAL CONDITIONS.

The temperatures and humidities suitable for various departments of a cotton mill vary with the nature of the process and the fineness of the yarn. In general, the finer the yarn the higher the humidity desirable. The following schedule of temperatures and humidities may be considered good practice.

	HUMIDITY	TEMPERATURE
Card Room	60 to 65 per cent	70 to 75°
Spinning Room . . .	60 to 75 per cent	75 to 80°
Winding Room . . .	75 to 80 per cent	70°
Weave Room	75 to 80 per cent	70 to 75°

SPRAY NOZZLE IN OPERATION.

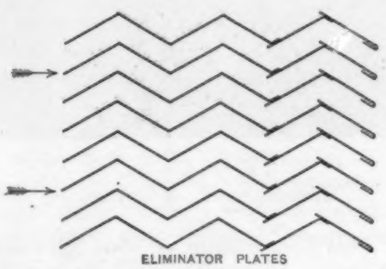
A very common error in the design of a humidifying system or apparatus is to assume that a cotton mill with all its machinery is to be taken care of in the same way and with equal ease as a vacant room, whereas no greater mistake could be made. An apparatus that will work to perfection in a vacant room, or even in a winding or weave room, may be an utter failure under the trying conditions in the spinning room. A system may work admirably in the spinning room in winter, yet be entirely inadequate to meet the exigencies of hot summer weather.

Evaporation and ventilation are interdependent—ventilation is necessary to secure evaporation. The maximum amount of moisture a cubic foot of air will hold depends upon the temperature. Whenever air contains the maximum possible amount of moisture at a given temperature it is said to be saturated, or at the dew point. Air at 60 degrees can not hold more than 5.8 grains per cubic foot; at 65 degrees 6.8 grains, at 70 degrees 8 grains, etc. Therefore, evaporation can occur only when the air in the room or at the apparatus is below the point of saturation. Hence, it follows that in order to secure cooling effect by evaporation the necessary amount of air must be introduced into the room to evaporate and to absorb the moisture.

The disadvantage of depending on natural ventilation is that it is at all times variable and uncertain. It is most difficult to obtain when it is most needed, and is usually so inefficient that even with the cooling effect of evaporation a considerable proportion of the heat must be cared for by radiation, producing a nundesirable rise in temperature in the mill. Natural ventilation combined with evaporation works most satisfactorily in winter, as a small volume of very dry air is much more easily humidified than the large volume of ventilation required in summer time together with a large amount of evaporation for cooling. In usingnatural ventilation, the cool dry air settles along the floor and next to the walls, the moist air being lighter goes through the ventilators without fully relieving the condition of the room. To cool properly the spinning room in summer, where ring spindles are used, and at the same time to maintain 70 per cent humidity, requires the air in the room to be changed every five or six minutes, depending upon the horsepower developed per cubic foot of space. This is required if the heat is to be properly removed whether using natural or artificial ventilation, and whether humidifying the air before or after it enters the room. The difficulties in the way of uniformly humidifying this great quantity of dry air after its admission into the room are very apparent. In fact, with fine yarn it is impossible to obtain a sufficient amount of natural ventilation to cool the spinning room in hot weather, owing to the disastrous effect of fluctuating window drafts upon fine "numbers."

The improved system which it is the purpose of this paper to describe is a fan system. It is adapted equally to summer and winter conditions using the same apparatus. It humidifies and cools in summer by artificial ventilation with cold saturated air, and humidifies and heats in winter by first saturating the air at the proper temperature, and then heating the air after saturation to a temperature sufficient to maintain the required temperature and humidity conditions in the room.

The apparatus consists of a humidifier, fan and heater and a system of ducts for the distribution of the humidified air. The humidifier consists of a large air chamber in which spray is atomized under high pressure by means of a large number of cyclone nozzles. The air is thus filled with an extremely fine mist in large volume, and thereby brought to the point of saturation. The free moisture is then separated from the air by an eliminator. The two principal features which make this humidifier a success are the design of the spray nozzles and the design of the eliminator. The construction of the nozzle is such that it is practically impossible to clog it with foreign material the smallest hole being 3/32 of an inch in diameter, yet it throws a perfectly atomized mist by reason of the centrifugal principal upon which it operates. The very difficult function of separating this finely atomized spray from the air current at high velocity is performed by an eliminator of special design. The form of this eliminator was determined by lengthy experimental investigations, and has now been in successful use for the past



four years. The fan and heater are of the usual design and need no special mention.

During the warmer weather the humidification of the air is obtained without the use of any source of heat, thereby securing the maximum cooling effect of evaporation and ventilation combined. In humidification the cooling depends upon the amount of moisture which the air will absorb to saturation, while the per cent humidity after saturation depends entirely upon the temperature.

The results obtained by this method of cooling and humidifying are exactly what would be obtained in cool foggy weather, by blowing the outside air into the mill in sufficient quantity to keep the temperature within a certain degree of the outside air temperature. The amount of air which would have to be used to accomplish this would depend entirely upon the amount of heat liberated by the machinery, which is easily determined.

This cold moist air ventilation, the writer believes, is the only method for effectually conditioning the spinning room in the hot dry weather of summer. It provides for a cooling effect which can be obtained in no other way, and by creating an air pressure within the building it excludes the warm dry air which tends to lower the humidity. The mill is cooled without opening the windows, in fact, is made very much cooler than it possibly could be made by opening all windows and ventilators. This permits the successful spinning of fine yarns in Southern climates, where it would otherwise be impossible, as the air is so introduced that it does not blow lint around the room, nor produce drafts near the floor. The diffuser distributes the air perfectly at low velocities. Humidity and temperature conditions are everywhere uniform.

The operation in winter is practically the same as in summer except that a considerable proportion of the air is returned from the building to the apparatus, and the heat is disposed of largely through radiation. The fan is also operated at lower speed, as a large volume is not then necessary for cooling. The air is heated after being humidified in the usual manner and the temperature may be regulated independently in each department without affecting the humidity. This result is attained through the use of auxiliary indirect heaters in the rooms requiring lower humidity and greater amount of heating. No auxiliary heaters are required in the spinning room for this is the department in which the most heat is developed. In the larger mills, where air ducts are placed on each side of the building, a double duct system of heating is employed, which takes the place of the auxiliary heaters and at the same time permits the temperature to be regulated in each department independently of the air volume and humidity. The temperature of the humidified air is regulated by means of heated spray water instead of using a variable air return as in the summer time. The spray water is heated by a steam injector, which is controlled automatically to obtain the desired temperature of humidification.

THE PASSING OF THE LAST HAND OPERATION IN THE COTTON MILL.

By Edgar F. Hathaway, Boston, Mass.

Up to within the last few years there seems to have been one of the necessary operations in the production of cotton cloth which has been totally neglected by the large number of inventors all over the world who have been working in the textile line, and although the development of cotton mill machinery has gone steadily on for many years past, and the progress made by inventors is still unchecked by their resultant success, still the mechanical development of this one process has been almost totally neglected, due to the formidable obstacles which present themselves when the subject is considered.

I am speaking now of the web drawing, or drawing in, and although it is true that the subject was first taken up many years ago, the first record that I am familiar with being that of an Englishman by the name of Biggs who undertook the construction of a drawing-in machine about the year 1868, and although since that time there have been several inventors who have made further efforts to produce a practical machine, it remained for a Boston company to produce a machine that was practical for every day use in the mills.

The evolution has been slow and tedious as the great varieties of work which a machine for this purpose has been called on to handle have made it a difficult proposition indeed, and only the utmost patience, backed by capital that showed unlimited confidence in the various engineers and inventors who had the work in hand, has made it possible to produce this machine in its perfect form, practically one machine (although made of different capacities) which will handle any kind of a pattern draw, any sley and any number of yarn which may be drawn into cotton harness of not over 6 leaves.

In the operation of the machine a worm or screw, something the shape of a cork screw worms itself through the harness spring or spacer taking a heddle with it at each turn, thus giving absolute control of each separate heddle. These spacers are placed on the harness when it is new and remain thereon until it is entirely worn out and discarded without any further attention.

The reed, no matter of what sley, is carefully handled and the proper dent automatically presented for the passage of the needle by a little device termed the reed-opener. This also operates on the principle of a worm or screw, and consisting as it does of a single turn of a screw thread, which, resting on the dents of the reed and worming itself through from dent to dent as the pattern calls, never being removed therefrom during its passage from one end to the other, gives absolute accuracy, in fact the record of machines in actual practice show millions of ends drawn without a single error in the reed.

Many efforts have also been made to produce a successful automatic warp separator. All sorts of separators have been produced and experimented with and many inventors have submitted their ideas for trial, without success. Most of these

Edgar F. Hathaway.

depended upon some sort of a fine hook or barb intended to deflect one thread at a time from the edge of a series of threads held in a perfect sheet, but owing to the many obstacles encountered in the nature of variations in the yarn, uneven slashing, knots, etc., coupled with the demand for straight drawing and absolute accuracy, it has been found advisable to use a semi-automatic separator, which, while it cannot always be depended upon to work absolutely perfect, is always under the eye of the operator, and separating as it does seven threads ahead of the one which is being drawn, it leaves no excuse for the operator doing anything but perfect work.

The speed of the machine is from 230 to 260 picks per minute, according to warp being handled, and the work turned out is so much straighter and in all ways better than that done by hand that the saving in the weave room alone is so great that it would be advisable to draw all warps by machine even if the saving of from twenty to fifty per cent in the direct drawing-in cost was not taken into consideration at all, or indeed if the direct drawing-in cost was greater than by hand.

These machines are capable of handling any pattern in the draw, and the making up of the pattern controlling chain is such a simple matter that it can be handled by any one of ordinary intelligence.

Some of the advantages of the machine over hand work are as follows:

One machine is capable of placing four or five average hand operators as it will handle from forty to seventy-five thousand ends per ten hour day. It occupies only about the space ordinarily taken up by two hand frames. It can be operated as successfully by artificial as by day light. It gives much straighter warps than can possibly be obtained by hand work. It handles any style of one beam fancies and any number of harness (up to six) with the same accuracy, speed and economy as it handles prints.

It is now working daily on sleys as high as 160s and as low as 40s and on yarns from 8s to 100s. The operators are much quicker taught than those by hand, as they become proficient in a few weeks. The large number of ends it handles makes it show considerable economy, as the price paid for machine operators only ranges from about eight to ten dollars per week when paid by day work, and when on piece work the price is usually set at about one-third the hand price, or from three and one-third to three and a half cents per thousand ends, while against this the only extra cost is the spacing of the harnesses which only amounts to about ten cents per thousand heddles, and is only done once for the life of the harness.

EXHIBIT OF TEXTILE MACHINERY IN CONNECTION WITH THE CONVENTION OF AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

We alluded in our May issue to a large number of textile machinery exhibits that were shown at the First Regiment Armory Hall, corner of Broad and Callowhill streets, Philadelphia, under the auspices of the American Cotton Manufacturers' Association. This exhibit was most emphatically the most complete and representative of any exhibit of its kind ever made in the United States, though chiefly confined to machines for the cotton manufacturing industry. We say this without qualification, and from our own personal observation at every exhibition of any magnitude since the one at Philadelphia in 1876. This recent Philadelphia exhibit was not only complete in its installation, but every one was ready for inspection on the opening day of the convention, which showed not only an intense interest on the part of the exhibitors, but the excellent management on the part of those who had it in charge. There was an unusual degree of satisfaction on the part of exhibitors, in the large number of people who viewed the exhibits, not purely through curiosity but through practical interest in the machinery itself. That it will result in trade admits of but little doubt, as evidenced by a number of orders that were placed for machinery, implements and supplies.

Perhaps no better place in the United States could have been selected for an exhibition of this kind than the City of Philadelphia, which made in 1876 the most representative international exhibit of the machinery and products of manufacture ever held in this country, though not on such an extensive scale as was witnessed at Chicago.

THE WESTINGHOUSE ELECTRIC & MANUFACTURING CO., PITTSBURG, PA.—This company's exhibit covered about 500 feet of floor space. It was plainly distinguished by a large electric sign "Westinghouse" which in turn was surmounted by Westinghouse pennant flags which have become so well known at the important trade exhibitions. These flags were kept waving by means of the "breeze" generated by Westinghouse electric fans.

The Westinghouse exhibit was first to be completed, and in operation. The feature of the entire exhibit was the part played by the electric motor, which in almost all cases were provided by the Westinghouse company.

A line of motors that are manufactured for the textile industries were shown in sizes ranging from ⅓ to 5 horsepower. Switches for controlling the motors were also shown. Mill type are lamps with plain and corrugated diffusers for indoor service were shown in use. A large assortment of electric fans were also seen, both operating and as a still exhibit. Those operating had blue Westinghouse pennants attached, which made quite

EXHIBIT OF THE WESTINGHOUSE COMPANY.

a unique effect fluttering in the breeze. One of these had been placed on each of the large square posts around the exhibit, as well as at a large number of other places around the Armory building. A large revolving picture rack containing about 50 views of the various textile industries, showed the many usual, and in some cases unique, applications of motors to machinery.

A very large portion of the Westinghouse exhibit was not included within their space, there being 20 of the textile machinery manufacturers exhibiting their apparatus driven by Westinghouse motors.

From the Westinghouse Lamp Company's factory (formerly the Sawyer-Man Electric Company), was shown a handsome case with their products.

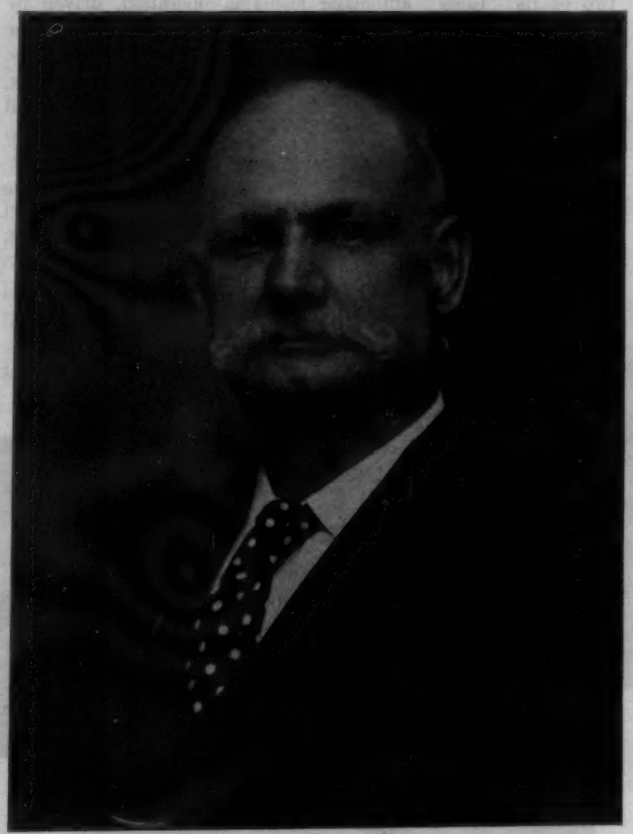
The Westinghouse company was conspicuous in the application of electric drive to various types of textile machinery. In connection with this there were issued interesting folders covering the joint subject of the machine that is driven, its application, and also the characteristics of the electric motors which operate them. The cover of the folder was very neat and appropriate for the occasion, it being a reproduction on paper of a sample of cloth for a summer suit.

The company also had for distribution from their exhibit a beautiful publication containing valuable information on the subject of electric motors as applied to the textile industry, including a number of papers prepared by electric specialists in this line.

The Cooper Hewitt Electric Co. showed six type K direct current lamps operating through a mercury vapor converter on alternating current. Each of these lamps give a column of light forty-five inches long, and one inch in diameter, with an efficiency about three times greater than arc lamps. They are notable for diffusion and distribution of light, and are used mainly for industrial lighting where color distortion is not objectionable, such as machine shops, foundries, spinning mills, freight sheds, etc. They are supplied for either direct or alternating current.

The following representatives of the Westinghouse Company were at the convention: J. C. McQuiston, Mgr. Publicity Dept.; J. J. Gibson, Mgr. Philadelphia Office; T. P. Gaylord, Mgr. Chicago Office; S. L. Nicholson, Mgr. Industrial and Power Department; M. H. Merrill, Mgr. Boston Office; S. St. J. Morgan; Albert Walton; F. S. Tucker, Charlotte, N. C.; J. P. O'Shea; E. D. Hays; Chas. Robbins, New York Office; F. Riebel, Jr., Motor Division, Pittsburg, Pa.; D. F. Stokes and H. I. Emanuel.

PHILADELPHIA DRYING MACHINERY CO., PHILADELPHIA, PA.—This company exhibited recent improvements in machinery for drying cotton stock, wool rags, skein yarn, piece goods, hosiery, underwear, etc., and illustrated certain improvements in the construction of hot and cold plate presses, together with the most



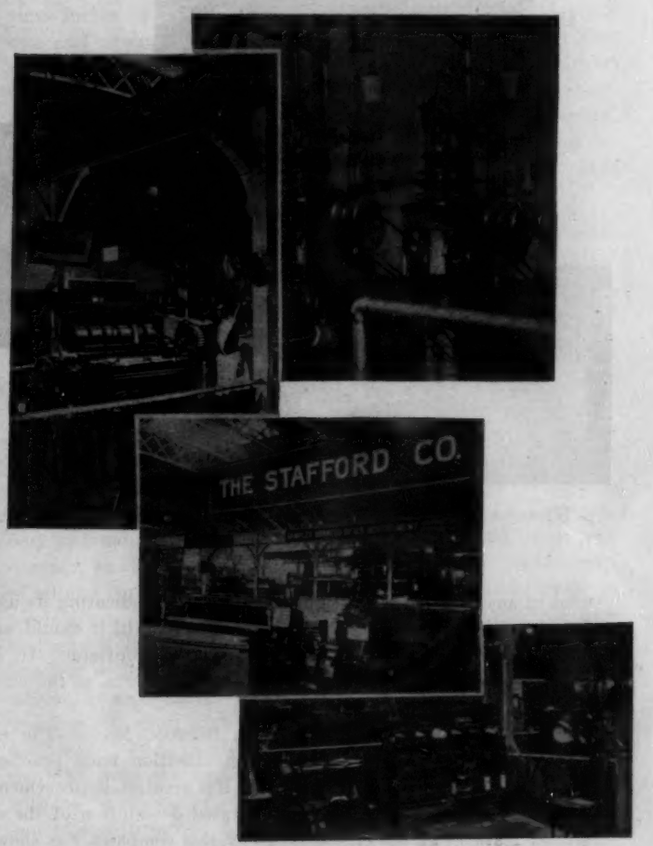
THOMAS F. BAKER,
MANAGER OF EXHIBITS.

recent ideas in dyeing and finishing machinery. This company also had an exhibit showing steel plate fans, ranging from 16 up to 50 inches in diameter, although it manufactures fans as large as 11 feet in diameter.

THE TEXTILE MACHINERY CO., BOSTON, MASS.—This company exhibited what is known as the Dunn Flyer. This flyer represents the most successful effort in changing the construction of a flyer within the last fifty years, and may be considered the only strictly American flyer in the market. Ninety per cent of the flyers that are used in cotton mills today are made in England, though the invention was that of an American. The Dunn flyer represents a new principle which is said to overcome all the faults of the present form of flyer, from the manufacturer's point of view. A notable feature in connection with this flyer was the enlarged diameter of the bobbin that it was possible for it to make, laying the roving in a more compact form, so that in the same diameter of the bobbin there is no roving, which is said can be done without injury to the roving.

TOLHURST MACHINE WORKS, TROY, N. Y.—This company displayed a 40-inch motor-driven hydro-extractor. The extractor was operated several pounds out of balance, for the purpose of demonstrating its self-balancing feature, as thoroughly as if the machine were performing actual service. The extractors made by this company can be had in sizes from 26 to 72 inches, and either belt, engine, or motor-driven. This type of motor drive appeals to many on acount of the rapidity with which the basket attains full speed, owing to the motor's ability to develop more than its normal power when starting.

THE GENERAL ELECTRIC CO., SCHENECTADY, N. Y.—The exhibit of this company illustrated the methods by which electricity may be economically adopted in the textile mill. To this end not only individual motor drives were shown, but special motor adaptations to meet requirements of textile machinery were exhibited, as well as most economical methods of group motor drive. The comprehensiveness of the exhibit was further enhanced by an explanation of the method of lighting mills by electricity. Both arc lamps with concentric diffusers for illumi-



EXHIBITS OF DRAPER CO., SCOTT & WILLIAMS, THE STAFFORD CO., AND THE UNIVERSAL WINDING CO.

nating factories and high efficiency incandescent units, for the effective lighting of more restricted areas, offices or individual machines, were exhibited. Among the interesting applications of the electric motor was an 82-inch Crompton-Knowles loom, driven by a 1 horsepower induction motor, illustrating the direct drive. Another feature of the exhibit was a line of small induction motors, ranging in size from 1 horsepower to 20 horsepower for individual drive, as well as a 100 horsepower motor with an improved belt-tightening arrangement. The last mentioned motor is adapted particularly for group driving.

CHARLES BOND, PHILADELPHIA.—Mr. Bond exhibited samples

of power-transmitting machinery, and leather belting of his own manufacture; also a general line of textile supplies, both domestic and foreign, in which he is a dealer.

ADAM COOK'S SONS, NEW YORK CITY.—This firm showed the various consistencies of "Albany Grease;" also various styles of grease cups, adapted to all classes of bearings, showing especially the "Albany Spindle Cup," which is represented as being economical and effective for the purposes for which it is intended. Demonstrations were made showing that the grease could be

EXHIBITS OF NATIONAL BRAKE & CLUTCH CO., GENERAL ELECTRIC CO., AND KILBURN, LINCOLN & CO.

used in any style of grease cup on the market, indicating its usefulness and value, adaptability and economy, which should appeal to the engineer or mechanic, as well as proprietor. G. E. Tanberg and W. E. Steele represented this concern at the exhibition.

NATIONAL BRAKE & CLUTCH CO., BOSTON, MASS.—The exhibit of this company attracted much attention from practical men, and was looked upon as one of the greatest improvements recently made in clutches. An illustrated description of the essential features of the clutch made by this company was shown in the May issue of COTTON. The "Compo," or cork, insert clutches and brakes were the distinctive features of the exhibition. The recommendation for the "Compo" clutch is reliability and freedom from the necessity of adjustment and repairs. The cork inserts or cushions can be used in all types of loom clutches, by which increased production on the part of the loom is obtained, also a saving of power and the lessening of repairs.

FRANK TOOMEY, PHILADELPHIA.—Mr. Frank Toomey exhibited the Barney compound ventilating fan, so constructed as to draw out impure air and drive in pure air, and designed to move large volumes of air at a low pressure with the utilization of but small motive power.

THE WESTERN ELECTRIC CO., PHILADELPHIA.—This company showed fan motors, exhaust fans and blowers for ventilating and drying purposes; also a new indestructible arc lamp, which is but 20 inches in length over all, including glassware, and for this reason is particularly desirable for operation on low ceilings. It is claimed to be practically indestructible, because its magnet coils are wound with deltabeston insulated magnet wire, which is said to be absolutely fire and water-proof. The lamp will stand short circuit for hours without the slightest injury, and demonstrations to this effect were made at the exhibition, showing the lamp in ordinary operation, and by tripping its clutch and sliping it upwards, thereby bringing both carbons together, short-circuited the lamp and extinguished the arc. These demonstrations were particularly interesting.

THE STAFFORD CO., READVILLE, MASS.—This company showed two of its "Ideal" automatic looms in operation, driven by Westinghouse motors, making cloth as closely to mill conditions as the limitations of the exhibition hall allowed. One of the looms was a 64-inch cloth loom, making heavy broad sheetings, the other was a 40-inch loom, supplied with a standard Stafford 16-harness dobby, making a line of light fancy goods, using cop filling. These looms were both of the company's latest construction. The magazines were made to take eight shuttles and the loom was equipped with positive worm-take-up metal cloth roll and other improvements. One of the looms was supplied with friction let-off, and the other one with a Bartlett let-off.

MORRIS & CO., GROVEVILLE, N. J.—This company showed a number of spring bottom duck baskets, extensively used in all kinds of textile mills, and elsewhere. The frame-work of these baskets is made of high-grade round spring steel of different

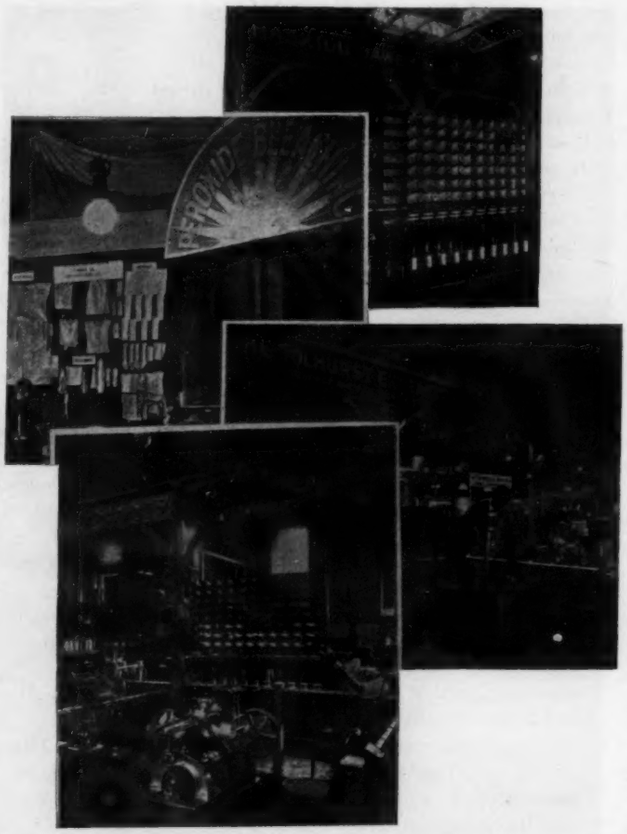
EXHIBITS OF LOWELL MACHINE SHOP, BELL PURE AIR AND COOLING CO., AND A. KLIPSTEIN & CO. (COHNEN DYEING MACHINE.)

sizes, suitable for the uses to which the basket may be put. The covering is made of cotton duck of good wearing quality.

KIP-ARMSTRONG CO., PAWTUCKETT, R. I.—The exhibit of this company consisted of what is known as a K-A electrical warp stop-motion for looms, and can be applied to any make of loom, and is adapted to every class of weaving from the finest to the coarsest warps, and for a low or extremely high sley work, making its scope practically unlimited. This motion has only two

small elements in its indicating mechanism,—a compound terminal and the drop wire,—with no oscillating or vibrating parts to get out of order.

THE BELL PURE AIR & COOLING CO., NEW YORK CITY.—This company exhibited its humidifying machines used in cotton mills, worsteds, mohair and alpaca mills, the object of which is to reproduce the best atmospheric conditions, and automatically maintain them throughout the year, regardless of external condition. The Bell machine, however, is not designed for regulating temperature, and is intended in textile mills purely for air moistening. An essential feature of this machine, or humidifier, is that it delivers not a spray, but air carrying the requisite moisture as aqueous vapor, just as it is found in nature. This



EXHIBITS OF ROESSLER & HASSLACHER CHEMICAL CO., HASKELL-DAWES MACHINE CO., TOLHURST MACHINE CO., AND HOLYOKE MACHINE CO.

humidifier takes up the water by rapid evaporation produced by the constant forcing of air at high velocities over large, ingeniously arranged wet surfaces. It treats all of the air in the room, checking the static electricity and laying the dust and impurities.

HOWARD BROS. MFG. CO., WORCESTER, MASS.—This company showed a very comprehensive line of card clothing for cotton and woolen work. The reputation of the work of this company is well known throughout the textile field. Herbert H. Whitworth represented the company at the exhibition.

HASKELL-DAWES MACHINE CO., BOSTON, MASS.—This company showed one of its new and improved high-speed tubing twisting frames of twenty spindles, built upon entirely new principles, and intended especially for the production of perfect strands above three-ply No. 10 yarn, and it is recommended for great economical value in the forming of larger strands required for woven hose, cotton duck, and a multitude of other products. To overcome the defects inherent in the ring and flyer systems, this company has invented this tubing twisting frame, which after numerous tests by several experts has demonstrated its great superiority over all methods of twisting. These frames are built with ten spindles on a side, 5x7 bobbin, and will run easily at a speed of 2300 revolutions per minute.

AMERICAN MOISTENING CO., BOSTON.—The apparatus exhibited by this company is perhaps the best known of any humidifier used in this country, if not in the world. There are about it no moving or complicated parts, and the cost for maintenance is low. It thoroughly humidifies the air, washes it of all impurities, destroys atmospheric electricity, and a considerable change in temperature can be effected by using cold or hot water in the machine.

LOWELL MACHINE SHOP, LOWELL, MASS.—This concern showed its camless winder, which is built in gangs of sixteen spindles, eight on a side, requiring a floor space of eight feet three inches by twenty-nine inches. Every spindle is independent, and equipped with a simple stop motion tension and slub catching device, the two latter being adjustable for various counts of yarn. Among the claims for this winder is the elimination of cams, simplicity of threading and doffing arrangement, automatic means for winding every package according to a design; compact construction and large product per spindle. It is suitable for woolens and worsted yarns, as well as cotton.

KILLBURN, LINCOLN & CO., FALL RIVER, MASS.—This company showed one of their heavy-pattern high-speed looms fitted with Northrop motions, also one of their 20th Century looms, especially designed for fancy weaving, and fitted with dobby and drop-box motion, both of their own make.

THE UNIVERSAL WINDING CO., BOSTON, MASS.—No exhibit attracted more attention than the one made by this company, consisting of its No. 50 winding machine, which is its latest model, as embodying the highest expression of mechanical construction in every detail, and so simplified and improved as to materially economize space and increase efficiency. The economy in winding on this machine is in its high speed, large production, small driving power, together with small requirement of oil and care, with practically no wear, and reducing waste to a minimum. The package that is made by the machine is particularly well adapted to every purpose, because the yarn is handled without strain or damage, and delivers with uniform tension in unwinding. The machine is especially adapted for winding soft spun yarn in conical form for delivery to knitting machines. It is particularly adapted for doubling fine yarns, the tension on the separate strands being maintained uniformly with no likelihood of cork-screws and irregularities incident to imperfect delivery. All the bearings are automatically lubricated.

A. KLIPSTEIN & CO., NEW YORK.—This company showed a 45-inch Cohnen dyeing machine for dyeing raw stock, carding slivers, skeins, tubes, cones, cops, etc. Samples of what this machine is capable of doing were exhibited. The machine hydro-extracts after dyeing, without removing the material, thus retaining all superfluous dye stuffs, and paying for itself in a short time both in the saving of material and labor. Everything is done in the same machine, and even in the same bath. It is especially adapted for sulphur colors. Perfect oxidation by means of compressed air is effected by it. The hydro extraction in vacuum before washing to prevent untimely oxidation of color on the fibre and all oxidation of color in the dyeing liquor, is

one of the striking features of this machine, resulting in the saving of a large percentage of the dye-stuff.

THE DRAPER COMPANY, HOPEDALE, MASS.—The exhibit of this company consisted of a complete running "E" model Northrop loom, driven by a Westinghouse motor. Small specialties of the company were also shown, as spindles, spinning rings, temples, bobbins, shuttles, etc. Probably no manufacturer in the United States is unacquainted with the Northrop loom, even if he has it not in his factory. As is well known, this loom is fitted with an automatic warp-stop motion, which acts to stop the loom in the event of a warp thread breaking. This loom is of the so-called automatic type, consisting of the mechanical insertion of bobbins or cops in the shuttle. This automatic substitution of filling in the shuttle decreases the labor and attention more than one-half, varying with the class of material being woven.

National Association of Hosiery Manufacturers.

Convention and Exhibition at Philadelphia.

The largest convention of hosiery manufacturers and exhibition of hosiery machinery ever held in the United States took place in Philadelphia, May 13th to 18th, the exhibition consuming all of this time, while the convention was limited to the first three days of the week.

Fully seventy-five per cent of all the members of the association were present at the convention, the membership aggregating over 200, including nearly all of the principal manufacturers of hosiery in both the North and the South.

It was generally admitted that the association has become a permanent one, under able management, and that it is doing a vast amount of good for the industry which it represents, and there is every reason to believe that future conventions will show even better records of practical utility to members.

The work of the association hereafter will be confined more to matters pertaining to the trade as a whole, though the special branches will receive the same attention as heretofore, relating to the technicalities of manufacture.

The chief subjects of discussion at the present meeting embraced mainly those affecting trade conditions, as the cancellation of orders by buyers, excessive charges for freight and cartage, the unreasonable demands of buyers for special labels, bands, boxes and stamps, charges on jobbers road samples, and the securing of the delivery of yarn by net weight.

Among the most important matters considered was a plan for credit information, the establishment of a department for the collection of exact trade statistics, and the appointment of a committee on legislation, to guard against adverse enactments.

The association adopted a method proposed for obtaining general information for its members, especially those affiliated with the manufacture of ribbed hosiery, the plan of which was explained by the secretary-treasurer, as follows:

"The proposition is to establish a general information system, by which manufacturers of ribbed hosiery will agree to furnish upon request to their fellow members, samples, prices and other information concerning their goods. Upon failure to comply with such a request, the secretary will have power to make a demand for the information. Failure to make satisfactory reply to the secretary's first letter will subject the silent one to a fine of $1.00. If he shall fail to reply to a second letter he will be fined $3.00, and failure to give the desired information at a third request, will subject him to a fine of $5.00."

In order to carry out this proposition, the following form of a circular letter was adopted, and will be sent to every member of the trade signing the agreement relative to the giving of information to their fellow manufacturers, which is understood to mean practically every member of the trade.

DO AS YE WOULD BE DONE BY.

Dear Sir:—You have subscribed to the following:

Failure to answer a request for information regarding the following questions by return mail from our secretary will subject to a fine of $1, second request $3, third $5. Please send me the following information:

No. needles. (If more than one, state all.)
Weight_____ Single or double thread_____
Double sole or just heel and toe_____
Last price_____ (If you have minimum and maximum price state both) _____
Terms_____ Freight allowed _____

The information that you give will be compiled, and this compilation sent to every member of the Misses Hose Association. It is suggested that you write the member selling his goods on a lower basis than you for a sample, (enclosing 10c to pay for same). This he has agreed to furnish you. Should he have decided to advance his price he so notifies you in lieu of the sample. This he has agreed to do. If he fails to make answer report him to the secretary at once.

The exhibition of hosiery machinery was the most complete ever shown under like circumstances, and demonstrated the interest that machine builders took in the objects of the Association. The consensus of opinion was that it was worth the expense, and an excellent advertising scheme, which will bear fruit for a number of years to come. Some good sized sales were effected covering the cost many times over.

The exhibition was held in a large building opposite to the Continental Hotel, where the convention sessions were held.

The following were elected for the ensuing year:

For president—P. C. Withers; for vice-president, Isaac Mossop; for secretary-treasurer, C. B. Carter.

Standing committees—Transportation committee—Julian Carr, Durham Hosiery Mills, Durham, N. C.; E. B. Gaylord, Winston Hosiery Co., Winsted, Conn.; and David Lowenstein, Union Manufacturing Co., Frederick, Md.

Membership committee—W. C. Woodburn, Newville Knitting Co., Newville, Pa.; Thomas W. Buck, Thomas W. Buck Hosiery Co., Philadelphia, and Harold Lamb, Union Manufacturing Co., Union Point, Ga.

Grievance committee—R. J. Fisher, Athens Hosiery Mills, Athens, Tenn.; Frank T. McElroy, Steelton Hosiery Mills, Steelton, Pa., and E. A. Thissell, Lowell Hosiery Co., Lowell, Mass.

Press committee—L. B. Conway, Jr., Danville Knitting Mills, Danville, Va.; F. A. Weiss, Holston Manufacturing Co., Lenoir City, Tenn.; and T. M. Nelson, Chambersburg Hosiery Co., Chambersburg, Pa.

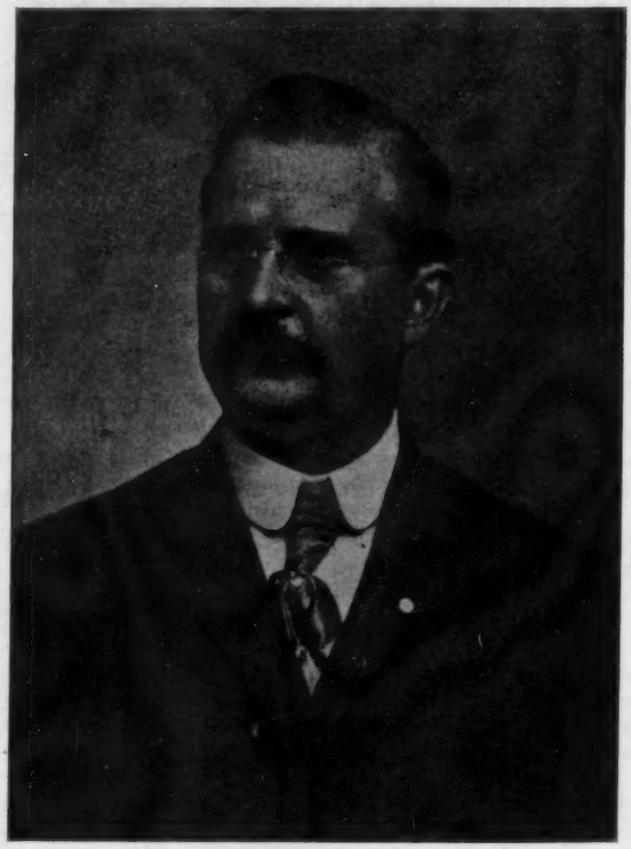
Legislation committee—H. A. V. Parker, Parker Hosiery & Dye Works, Portsmouth, Va.; A. W. Sulloway, Sulloway Mills, Franklin Falls, N. H., and R. J. Sharp, Richmond Hosiery Mills, Chattanooga, Tenn.

Statistics committee—S. H. Weihenmayer, Blue Ridge Knitting Co., Hagerstown, Md.; H. R. Berry, Rome Hosiery Mills, Rome, Ga.; and W. I. Fay, The Fay Stocking Co., Elyria, O.

The opening session, on the morning of the 13th, was called

to order by President Frank L. Chipman, with over one hundred and fifty members present.

After President Chipman had delivered his annual report, Secretary-Treasurer C. B. Carter presented his report, in which he stated that the National Association of Hosiery Manufacturers, as a national movement, dated from November, 1905, though succeeding, as a matter of fact, The Southern Association of Hosiery Manufacturers. The membership of the association has increased during the past year from fifty-eight to one hundred and ninety-five, indicating the wisdom of the movement, and of the confidence of the hosiery mills in the country in the organization in its ultimate accomplishment. The key-stone of the association's structure is the individual discretion of members as to whether or not they will participate in or be bound by



JOSEPH F. RAMBO,
PRESIDENT OF NATIONAL ASSOCIATION OF HOSIERY MANUFACTURERS FOR 1907-08.

any resolutions or procedures which may be adopted by the association. It is not within the power of the association to dictate the policy of any individual member.

The report of the executive committee was read by the Chairman, J. H. McPhail, of the Nashville Hosiery Mills Co., Nashville, Tenn., who spoke of the good results which have followed the establishments of permanent headquarters in Philadelphia, and alluded to the realiaztion by the members of the fact that some of their competitors are misinformed or ignorant of the true cost of manufacture and and distribution, which is proving as disastrous to their interest as though they themselves were unfamiliar with the true conditions along this line.

The convention listened to an excellent address by Fred W. Simons, second vice-president, and member of the Simons and Struve Hosiery Company, Frankford, Pa., entitled: "Association Work, Its Objects and Purposes." We give an abstract of this paper.

The plan of holding exclusive meetings, as was instituted at previous conventions, was held to during the present one, meeting with general favor among the members, as indicated, in some instance, by the comment made to the presence of several commission merchants at the sessions, but it was found, upon investigation, in this respect, that these parties were eligible to be present during the discussions, because they were stockholders or directors in various mills, and in these capacities were manufacturers.

The afternoon session of the 13th was devoted to a preliminary meeting of manufacturers of children's ribbed hosiery, which meeting was well attended. A general meeting was held later in the afternoon, which was also well attended, being largely devoted to the address on "Cost Accounting" by J. L. Nicholson, President of the American Cost Accounting Company, New York. This paper was freely discussed, which showed the interest taken in the subject by the members. We give a liberal abstract of this paper elsewhere, because of its practicability.

The latter portion of the afternoon was given up to a submeeting of manufacturers of Half-Hose up to 176 needles, of which Harold Lamb, of the Union Manufacturing Co., Union Point, Ga., was chairman.

The Tuesday morning session was held in the Assembly Hall of the Continental Hotel, and was called to order by President Chipman. The first subject of discussion was, "Cancellations by the Jobber and Manufacturer." It was explained by Secretary Carter that this subject was brought before the members by one of their associates, who wanted to know what was the proper procedure when a jobber called for goods due him on a contract that had expired months previously. After more or less discussion, it was proposed that a committee be appointed to draft a standard form of contract to be adopted by the association. It resulted, however, in a recommendation that a conference be held regarding this matter with the Jobbers' Association, and the matter was left in the hands of the executive committee to arrange such a conference.

The report of the committee on legislation was read at this session, being written by R. K. Sharp, Chattanooga, Tenn., a member of the committee that was appointed to investigate this subject. This report is given in abstract elsewhere.

The report of the committee on cost accounting was presented by Chairman J. H. McPhail, in which he stated that after "carefully canvassing the subject of cost finding with manufacturers, we are convinced that many figure every item of cost with the exception of two—namely, interest on capital stock, and depreciation on plant. We believe these omissions largely responsible for the great difference in the selling price of similar articles produced under apparently the same conditions. We, therefore, strongly urge the members of this association who have not been figuring interest and depreciation in their costs to do so in the future, because it gives them a dead line, below which it is not safe to go."

At this point in the proceedings, Harold Lamb, ex-president of the Association, presented President Chipman, in behalf of the members of the association, with a silver loving cup and a silver tea service. Both Mr. Lamb's speech of presentation and President Chipman's speech of acceptance were heartily received by the members present.

The Wednesday morning session was an open one, with President Chipman in the chair. This session was given largely to reports of sub-committees, the Children's Ribbed Hosiery Division, stating that it had formed an auxiliary division for the manufacturers of children's hosiery, whether ribbed or not, and

that it had elected a permanent chairman and secretary-treasurer, with annual dues, the idea being to gain information of all kinds from one another, binding themselves to nothing, but hoping that members will answer such questions as are asked, and which they may deem reasonable. It also appeared that the Men's Half Hose Division was thoroughly organized, and will endeavor to be of great assistance to one another, with the exception of the exchange of samples.

This last day's session was closed with an address from Wilbur F. Wakeman, Secretary of the American Protective Tariff League, New York.

LIST OF EXHIBITORS.

Roessler & Hasslacher Chemical Co., New York City, N. Y.
National Automatic Knitter Co., Philadelphia, Pa.
Scott & Williams, Philadelphia, Pa.
O. F. Zurn Co., Philadelphia, Pa.
Paxton & O'Neill, Philadelphia, Pa.
Smith, Drum & Co., Philadelphia, Pa.
Salvator Transfer Co., New York City, N. Y.
Wilkins Transfer Co., New York City, N. Y.
Hemphill Manufacturing Co., Pawtucket, R. I.
Boss Knitting Machine Co., Reading, Pa.
Merrow Machine Co., Philadelphia, Pa.
Textile Manufacturers Journal, New York City, N. Y.
R. Greenwood & Bault, Philadelphia, Pa.
Lord & Nagle, Boston, Mass.
Nevershrink Process (Charles E. Heyer), Philadelphia, Pa.
E. F. Houghton & Co., Pawtucket, R. I.
Wilfred Wells, Philadelphia, Pa.
C. J. Jones, Philadelphia, Pa.
Kaumagraph Co., New York City, N. Y.
Manufacturers' Supply Co., Philadelphia, Pa.
Jacob K. Altemus Machinery Co., Philadelphia, Pa.
E. Jenckes Manufacturing Co., Pawtucket, R. I.

ASSOCIATION WORK—ITS OBJECTS AND PURPOSES.

FRED W. SIMONS, FRANKFORD, PA.

The preliminary work of organizing and drilling our forces is not a little matter; it requires a great deal of patience and diplomacy. It is a far cry from coaxing into the Association the man who don't believe the hosiery trade can be organized anyhow, to quieting the enthusiastic fellows who think the Association ought to place their business on a paying basis in consideration of their first year's subscription. We are fortunate in having a man equal to the job. If he was a hosiery manufacturer he would have neither the time nor the patience for the work.

"Association work"—what is it? Probably the question uppermost in the mind of most of us at the present moment is the question of selling our product, and the problem of making a profit. Is the consideration of these questions association work? I think so. Of course the association is not a selling agency, most likely it never will be; and perhaps we cannot have a selling agency officially connected with it; but discussion of methods of selling with a view to selecting the best method is certainly "association work." We ought to give much consideration to it; in fact, it is the most important question we can possibly consider. Gentlemen, there's something the matter with the selling end of our business.

If we only got enough money for our goods, if we only had a legitimate return on our investments, and decent compensation for our work, all the rest of our grievances would be quite endurable. But why can't we get it? What is the trouble? Who is to blame? It is puerile to blame it on the general conditions and to say it is owing to circumstances over which we have no control. We must find out how to change the conditions and how to control the circumstances. It is equally ridiculous to place the blame upon our customers; there is not a merchant in the world whose trade is worth having who does not buy his merchandise as cheaply as he can; and if you know a jobber who is habitually paying 5 per cent more for his goods than his competitors were paying, you would think him incompetent, and would be afraid to sell him.

Who, then, is to blame for the fact that we don't get remunerative prices for our goods, except ourselves? How is the trouble with our selling to be remedied? I can't tell you—and if I could you would think I was "talking through my hat"—but get together and talk it over and when you are not together think it over; and if your think your think amounts to anything, send it to the secretary or to some of the officers of the association; that's "association work."

I don't mind saying in connection with the question of selling, however, that it appears to me that it is a ridiculous proposition that 500 manufacturers whose output is taken by 500 jobbers should need 500 selling agents to do their business. I don't like the method now in vogue of selling our product, anyway; but if the selling agent is a necessary evil, at least let us reduce the evil to its least common denominator—cut the thing down at least 90 per cent.; 50 selling agents instead of 500 would simplify matters a good deal. There is a general idea, a general feeling prevalent, that it is policy to keep as far away from your direct competitors as possible; and the first thing a manufacturer asks a selling agent who applies for his line is, "Whose goods are you selling? Have you anything that conflicts with my line?" And if the agent can't show that he don't have a competitive article, the manufacturer don't want the salesman.

I think that it is all wrong. Take my line, ladies' 200-needle goods or 176-needle half-hose, for instance; suppose the whole product of such goods was sold by four or five agents instead of forty or fifty agents; would it not be much easier to control the situation?

Then, apart from the consideration of methods of selling, and yet closely akin thereto, is the question of values. What ought we to get, and what can we get for our goods? There's a problem for you. There are nuts to crack, and plenty of them, good old hard-shell fellows that you can easily break your teeth on if you are not careful; and more than that—you can crack up the association instead of cracking the nuts if you go the wrong way about the job.

Yet I hold that the consideration of values is "association work"—mark you, I said "consideration of values," not "fixing of prices." You can't fix prices for more reasons than one. In the first place, such action would be contrary to law, and would constitute conspiracy in restraint of trade. We would lose ground at Washington if we attempted to do it, and would probably get the man with the big stick after us. A reciprocity treaty with Germany might knock the props from under full-fashioned and high-grade seamless goods, which are about the only goods which have got any props under them at the present time. Then, again, you cannot make uniform prices because goods of the same guage, weight and grade of yarn, but made by different manufacturers, are not of uniform value. I do not mean by this to cast any reflection upon the ability of any manufacturer, but the conditions under which we work bring about, and must bring about, this difference in value. The manufacturer whose mill is situated in a great manufacturing district has to pay more for his labor, and his general expenses are greater than the man whose mill is in a country village, but he has the best labor and can turn out the most perfect and best finished goods. This is not always the case, but it is generally so—

it is so on the average—and he ought to get more for his goods, because they cost more than the goods of his country competitor. As a matter of fact, they do bring more; they have a higher market value; the jobber grades the knitting mills just as the knitter grades the yarn mills. You will pay one spinner more than another spinner for the same count of yarn because it is worth more; and the jobber will pay one knitter more than another knitter for his goods because they are worth more. I think it is not too much to say that there is a variation of 10 per cent in the value of products of the different knitters. How, then, can we make uniform prices?

We can't fix prices, and we had better not try, but we can discuss values; either by specially appointed committeemen in conjunction with the officers and executive committee, or by the convention going into committee of the whole, then advising all members of the association what the results of our deliberations are. Of course, the resulting figures would not be binding upon anyone, but they would be of value to many members as being the official opinion of the association, and would be at least some indication as to what their goods should bring.

COST ACCOUNTING AN ECONOMIC NECESSITY.

J. LEE NICHOLSON, NEW YORK.

The battle for commercial supremacy and the struggle for business existence in these days of close competition has forced upon the manufacturer the absolute necessity of organization.

Modern commercialism not only demands the finest machinery and the most capable men, but also renders it imperative that all component parts be knit together by modern methods of systematic organization.

The vital elements of industrial enterprises are (1) the application of energy along those lines where the greatest results can be accomplished; (2) the elimination of all waste, which interferes with such results.

It is now a recognized fact that great economy can be effected by the introduction of rational and efficient factory systems which will properly care for the highly important detail of factory work.

How often has it occurred that a firm prosperous in the early days of its existence failed utterly after it had grown to such size as to make it impossible for the heads to retain that personal touch with details? The need of something to take the place of this personal touch is imperative and increases as the concern grows larger.

Let us understand fully at the outset that there is no infallible "ready made" system, which will fit all cases alike. Methods must be suited to the circumstances and conditions of the particular business.

Cost keeping is a subject of fundamental importance. There are still many manufacturers who are not satisfied to give their unqualified approval to modern methods. The number, however, is growing less every day, but there are a few thousand yet, to whom these remarks can apply.

There are, however, many manufacturers today who realize that something is wrong, seriously wrong, and who would be glad to apply modern methods if they but knew what they were and how to apply them, but to many a man, who is intent upon improving conditions, ignorance, prejudice, false pride and stubbornness on the part of those in his organization confront him. The greatest economy in production is often reached by a liberal expenditure for brains. A small amount saved on each article manufactured very often means success and wealth.

The subject of cost accounting has been approached on different sides by the manufacturer and by his bookkeeper, but each has viewed it from his perceptual plan and from his own isolated scheme of activity. The manufacturer knows the results he should acquire and knows how to use them when secured, but he has not sufficient knowledge of cost accounting principles to adopt them, while the bookkeeper, though skilled in analysis, is generally unable to appreciate the requirements of the manufacture in this respect. It is of primary importance to the manufacturer to know the accurate cost of any article that he sells. With the constant varying elements in the cost of production no manufacturer can feel sure of his ground without this knowledge.

The cost of producing the same articles varies, under different conditions. The elements which make up the prime costs and which are direct charges against the price of the article are subject to a number of purchase price changes, and, while even more difficulty is caused and miscalculation results from a defective estimate of the non-producing labor, supplies, indirect expenses, depreciation and selling expenses. In but few cases do the results at the end of the year fulfil the expectations of the manufacturer who is guided in his selling results solely by his estimates.

The cost of production and operation should be accurately known and should be properly tabulated, so that it may be compared with previous and subsequent costs. In this manner any variation in the cost of manufacture is immediately determined and any economy that may be necessary is at once brought to the attention of the executive, thus he is enabled to acquaint himself with all the details of the factory, to be fully conversant with the labor and material cost, and to know from day to day the results and profits of his business. A cost system is an analysis of the transactions in a factory by which the various kinds of costs are properly distributed; thus it substitutes accurate results for estimates and supplies the manufacturer with reliable information.

It is not only necessary to know the total cost of the article manufactured, but the cost of each operation as well. This cost should include all factory expenditures, such as material and supplies, direct and indirect labor, department indirect expenses, general factory expenses, maintenance and depreciation and, in fact, all expenses of whatever description and kind that are connected with the plant. All indirect expenses, properly chargeable as cost of production should be distributed according to actual expenditures and not according to past experience, as is usually done. The cost records should clearly indicate the efficiency or inefficiency of all operating departments and should make it possible to prevent waste, shop errors, loss of time, or negligence on the part of employes.

It is advisable in many manufacturing establishments to have the cost records show the efficiency of the machinery. The cost records should show what it costs to maintain and operate each machine, as well as the capacity and working efficiency of each, in order that a proper record of production may be obtained. These records should be so arranged as to indicate whether the machines are 40, 50, 80 or 100 per cent efficient. By this means, the decreased production is at once brought to light and the capacity of the plant maintained.

By supporting machine records with time records, the cost of operation may be obtained in such a way as to make it possible to operate most all departments on piece work prices based on comparative machine costs.

It should be remembered that with decreased production, indirect expenses remain practically the same, but being distributed over a lesser output, the cost of production is increased.

There are perhaps more mistakes made in applying indirect expenses than in any other elements connected with the finding of costs. The usual method of adding a certain percentage upon

every article manufactured to cover all indirect cost is wrong in principle. The principle elements in indirect charges are department indirect, department supplies, general indirect and general supplies.

The accurate cost of any article cannot be known unless the indirect expenses are handled under these divisions, for instance, some departments have more indirect expenses than others. One department may demand more floor space than another. The number and salary of foremen may be greater in one department than in another. And in the same manner, such items as indirect labor, power, and supplies vary considerably in the different departments.

Then again, all articles do not pass through all of the operating departments, and the charge for indirect expenses varies accordingly.

For the sake of illustration, let us suppose that there are a certain number of operating departments in a factory, say five. A certain class of product passes through all five of these operating departments. Another class of product passes through all but three of them. It is evident that by charging a fixed percentage for indirect expenses on all articles, that the product which passes through only two departments is being charged the same as the product which passes through five departments. In other words, the indirect expenses of the two departments through which this product does not pass is being charged up against the cost, the same as if it had.

By this, it can clearly be seen that unless indirect is applied, (1) by departments, and then by general indirect, the accurate cost cannot be known, for, unless this is done, some articles will be charged with more than they should be and some with less than they should be.

In order to give a clearer insight into the methods of accounting for cost keeping, I will quote you classifications from an Operating Ledger and General Ledger in a textile plant.

Under the general classification "Factory Expenditures," the operating department should be: Sorting, Scouring, Carbonizing, Dyeing, Picking, Carding, Spinning, Knitting, Rib Knitting, Seaming, Boarding, Finishing, Packing, Box Department.

The cost of operating each of the departments and the cost of each process through which an article passes is determined. This cost includes not only the prime material cost and direct labor cost, but also all indirect expenses chargeable against each department. Such expenses would be as follows: Indirect Labor, Supervision, Supplies, Light, Heat and Power, Maintenance, Rent, Incidentals.

In addition to the expenses which should be charged against one department or another, there will be certain expenditures which are somewhat general in their nature, and must be charged against all departments. To the department expenses, as stated before, there must, therefore, be added the pro rata share of each department in these general indirect expenses, which are as follows: Superintendent, Light, Heat and Power, Supplies, Freight, Express and Cartage Inward, Insurance, Taxes, Maintenance, Telegraph and Telephone, Postage, Printing and Stationery, Salaries of Office Clerks, Factory Office Supplies, Incidentals, Depreciation.

The product of such a plant would be classified as follows: Men's Garments, Ladies' Garments and Children's Garments. Each of these classifications would in turn be subdivided. For example, the subdivisions under Men's Garments would be: Natural Wool-Mottled, Natural Wool-Mixed, Fine Natural Wool Mixed, Coarse Natural Wool-Mixed, All Wool-Natural, Fine Camel Hair, Coarse Camel Hair, All Wool Camel Hair, Plush-Natural, Plush-Solid Colors, Miscellaneous. The sales in each of these sub-divisions, together with the cost of sales, and the gross profit, would be shown.

Against the gross profit would be charged all selling and administrative expenses. The "selling" expenses would include: Advertising, Traveling Expense, Freight, Express and Cartage Outward, Commission, Salaries of Salesmen, and the "Administrative" expenses would include: Salaries of General Officers, Legal Expenses, Salaries of General Office Clerks, Interest, Merchandise Discount, Postage, Printing and Stationery, Telegraphing and Telephoning, Depreciation of Fixtures and Furniture, Insurance, Doubtful Accounts, Incidentals.

The balance obtained by deducting these expenses from the gross profit would give the net profit or loss upon each class of the product.

There are many who are unaware of the fact that one or two profitable departments of their factory are paying the losses of others, that for one reason or another are not netting expenses. They are satisfied with the combined profits, which are small, not realizing that the large profits, which they are actually making, are used to pay the heavy losses of certain mismanaged departments of their business. It should be borne in mind that it does not require a thorough system to stop a leak that is apparent without any system, but it does require a good system to detect the invisible, yet never ceasing drip that wears out the foundation stone of a great business.

REPORT OF COMMITTEE ON LEGISLATION.

The Government has lately negotiated with Germany an agreement of an alleged reciprocal nature, the operation of which will result in the very action predicted in the report. A special committee composed of tariff experts was sent to Germany, with instructions to make full reports and recommendations regarding concessions to Germany, the character of which would cause that country to refrain from imposing her maximum rates on American importations. The final report of this commission has not been submitted, but enough progress has been made to indicate the trend of their recommendations.

In brief the United States is to withdraw from Germany all of our special agents at present employed in reporting upon the real value of exports to America. Our custom officials, as well as our foreign consuls, are to accept the statement of German boards of trade or chambers of commerce as to the export or original value of goods. In addition to the above, all appraisements of merchandise at American ports under the Dingley tariff law are to be made (when open hearings are had as to real value) in the presence of the importer.

In other words, the present purpose of the Government seems to relieve the pressure from German source, not by amending the present tariff law and its rates, but by letting down the bars in the manner and method of administrating that law. All of these matters will eventually be brought to the attention of the finance committee of the Senate, which, it is rumored, will soon hold a special session.

At the meeting of the finance committee hosiery manufacturers should present their case, backed up by statistics covering American output and foreign importations. At present the concessions made to Germany will only effect the full-fashioned hosiery manufacturers, but once this growing branch of our business has been exterminated, the German manufacturer will not be slow to enter into competition for control of our seamless market. This whole situation is full of danger to our domestic manufacturers, and if some vigorous action is not taken at once, our association will awaken later, only to find that the cream of their industry has been sacrificed to care for the interests of some other American industry which has been more alert

and keener than we have been in promoting its interests, both at home and abroad.

We should take the broad American stand that our industries as a whole, and particularly the weaker ones, to which class we may belong, should be carefully and uniformly protected, and thus preserve to the American wage earner, as well as the home manufacturer, our splendid home market, with its high wages and excellent standard of living—a market which has an accelerated growth, due alike to a more cultured citizenship, and the incoming of a million immigrants annually.

THE DESIGNER.

THOMAS NELSON.

The work of the designer calls for the highest order of skill in the construction of new fabrics. He must ever keep before him the thought of good taste in color combinations and the general appearance of the fabric. The designer is also required to make some effort to produce novelty effects, for the demand at the present time tends toward novel effects. To make or originate new designs, the designer's ingenuity is often taxed to the utmost, and anything that will help to give him new ideas is always eagerly seized upon by him. A new fabric or a new

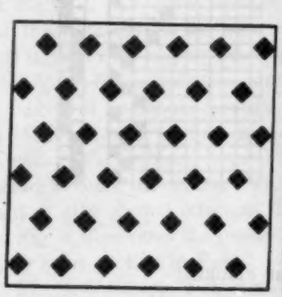


FIG. 1.

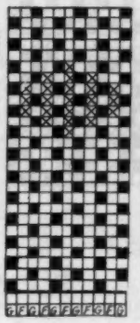


FIG. 2.

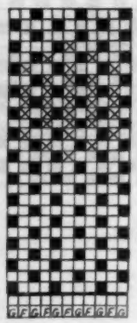


FIG. 3.

combination of weaves and colors in a fabric is always acceptable, not because of the fabric itself, but because of the field it opens. For this purpose a collection of samples is a valuable asset, for by comparison and adaptation of one fabric with that of another, new and artistic designs can be made, and other new and artistic designs suggested by the new combinations.

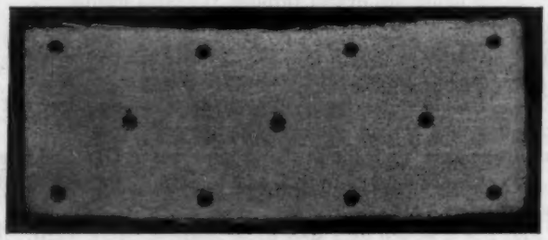


FIG. 4.

Imagination and adaptability are two very essential requirements of the designer. His imaginative powers are often called upon in order to construe or form in his mind's eye the effect that would result from certain combinations, and then to adapt them so as to have a fabric that would be saleable. Sketches are often used as a means by which new designs can be produced. A figure can be sketched on paper, and from this sketch a whole line of samples can be produced by the use of the imaginative faculty. By changing over from one part to another, or by increasing or decreasing space between certain parts of the sketch, new designs can be formed. This method of getting out new patterns is often used for dobby fabrics, and is especially applicable for fabrics ornamented by the use of additional warp threads, on what would otherwise be a regular fabric. The sketches would be made to represent the effect desired to be produced by the extra threads.

Fabrics with extra warp figures are made extensively in the cotton goods trade, and are used in almost every conceivable form, so that the following explanation and description will illustrate practically the method by which these effects are produced.

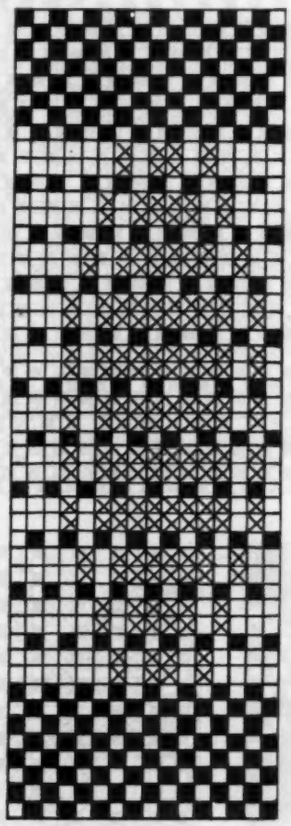


FIG. 5.

FIG. 6.

FIG. 7.

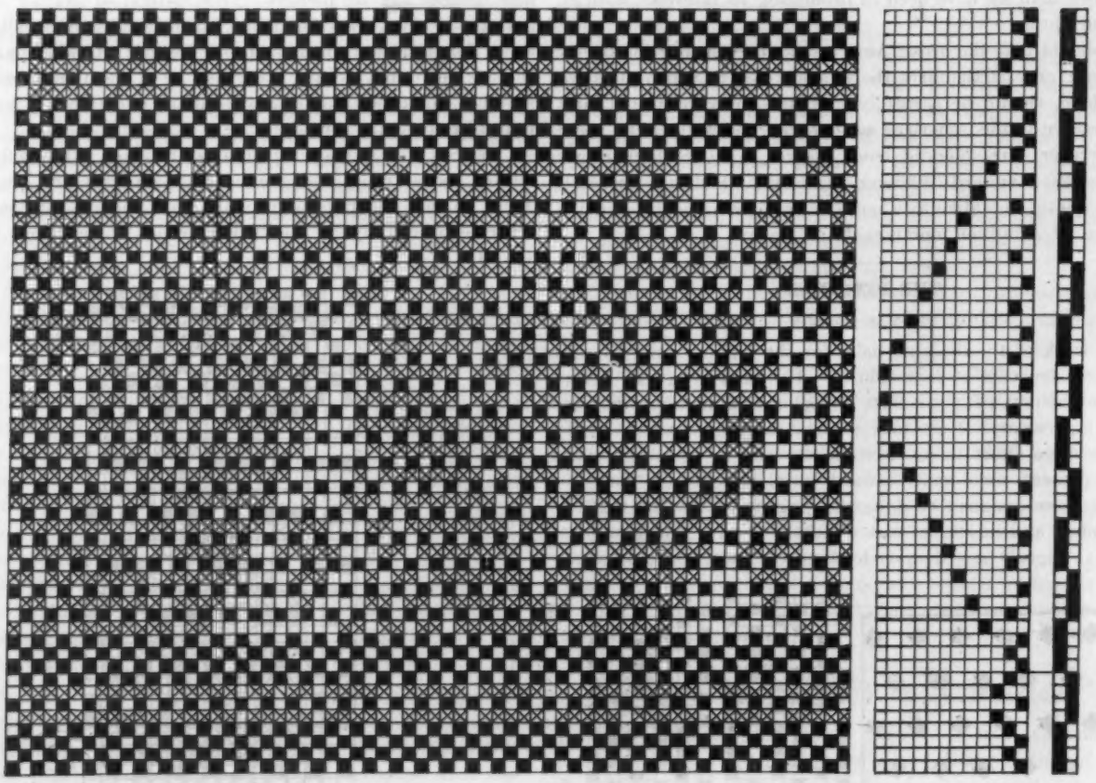
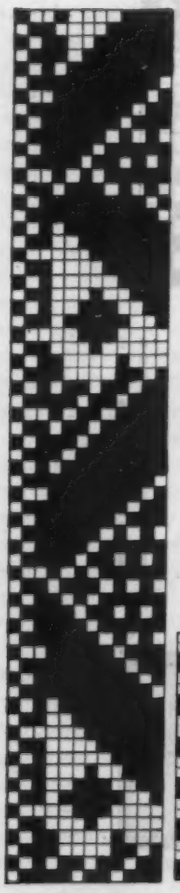


FIG. 8.



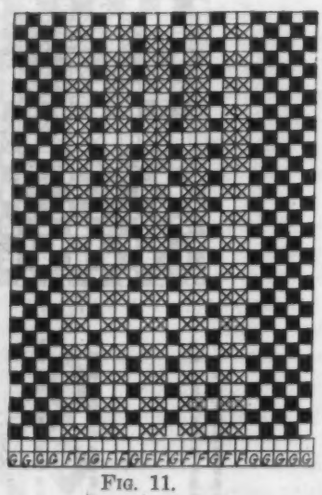


FIG. 11.

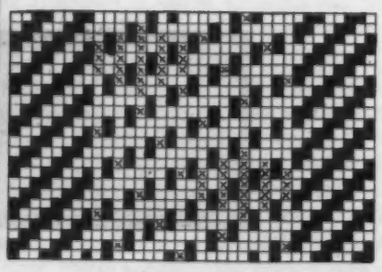


FIG. 9. FIG. 12.

EXTRA WARP FIGURES.

These effects are made in every conceivable way, in spots according to motion stripes and fancy figures. These effects are generally formed on the face of what would otherwise be a regular cloth. The figuring threads are usually two ply, and when mercerized yarns are used, exceptionally good results are obtained. It must be remembered in laying out one of these fabrics that the figuring threads are extra, and are only used for ornamentation. These fabrics are generally constructed so that the figuring threads will be on a plain ground. The threads are arranged one ground, one figure, although in many cases two threads for figure are drawn through the same heddle eye. The extra threads are crowded in the reed with the threads for the regular cloth.

TO LAY OUT DESIGN FOR EXTRA WARP FIGURE.

First. Decide on the figure to be made. Second. Lay out design paper one thread ground, one thread figure. Insert the weave for figure, then fill in the ground weave. If design calls for two threads figure, lay off two lines for figure and fill in same.

Fig. 1 is a sketch of a spot to be made in extra warp. This

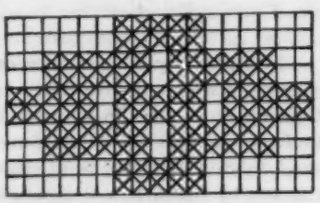


FIG. 10.

spot can be arranged in exactly the same order as given, or the spots can be made farther apart and instead of having six in the given space three spots could be made.

Fig. 2 illustrates the method of laying out the design. Threads arranged one ground, one figure. G indicates ground threads, F indicates figure threads. This spot (illustrated in design by X) will not give exactly the effect as called for by sketch but is given merely to illustrate the principle of laying out the design. To ascertain the number of threads and picks on which the spot would actually be made the reed number will have to be known. For example. Suppose the spot has to be made in a fabric and to use a number 32 reed. The spot measures one quarter of an inch, so that the extra threads for the spot could be recalled in eight dents.

This with two extra threads will give 16 threads for spot, but as the spot is made with a point drawing in draft, the first and last threads would be exactly the same so that 17 threads would actually be required. If 64 picks per inch are required in fabric the spot would be made on 16 picks, that is, the center thread would be on this number of picks with the other threads reduced in proportion. In such a case as this, 16 picks might possibly make the float of center threads too long, if so, the threads could be bound in the middle of the float. It will be noticed in design that the figuring threads float at the back after having made the spot. This brings up another point. If the yarns for the fabric are very fine, the extra threads which float at the back will show through on the face. The only remedy for this is to cut off the loose threads that float at the back. If this is done with a spot, woven on the same principle as in design Fig. 2, the fabric will lose much of its value, since the fingering threads will be unable to resist friction and will easily pull out, as they will only be held in place by compression of the warp threads. To overcome this defect, the extra threads must be bound around the figure. This binding in many cases is also used to give shaded effect to the figure.

Fig. 3 illustrates the method of binding the figuring threads, using same spot as in Fig. 2.

Fig. 4 illustrates a shirt-waist fabric with a spot on the surface made by extra warp. The extra threads are bound around the edges of the spot and the loose ends are cut from the back of cloth.

Fig. 5 illustrates the weave for spot used in fabric. In many cases the extra threads are required to make the figure entirely on the face of the fabric and not float at the back. To illustrate this point, the following figures are given.

Fig. 6 is a sketch showing the outline of a pattern to be produced in cloth.

Fig. 7 is the fabric which could be made from this sketch.

Fig. 8 is the design, drawing in draft and reed plan.

Fig. 9 the chain plan for fabric. Design is given only for figured and narrow stripe in center of fabric. The two narrow small stripes on each side are exactly the same as the single narrow stripe which adjoins the figured stripe.

It will be noticed in this design that the ground threads weave plain all the time. In some fabrics the ground threads for the stripe do not weave plain with each other, but are all raised on one pick and the figuring threads on the next pick. Fig. 10 to illustrate, is a spot to be made in design.

Fig. 11 the design. Instead of the extra threads weaving plain they could be made to float and this would give a more prominent stripe. Again, in some fabrics the extra threads are brought to the surface of the cloth for the figuring and are then passed through the cloth to the back. For various reasons it may not be advisable to cut the ends from the back or to let them float at the back. To overcome this the extra threads have to be bound to the cloth. But with a plain weave this cannot be done without the extra threads showing on the face at the binding. To remedy this, a two up, two down twill weave can be used and the extra threads raised in the cloth between two warp floats which covers them.

Fig. 12 illustrates this principle, showing how the figuring threads are raised for binding between two warp floats.

THE PREPARATION OF COTTON WARPS.

WILL NELSON.

It is an absolute fact, that, according to the care exercised in the preparing of the warp and all pertaining to it, so are the results good or bad in the weave room. Unless great care is used in the several processes through which the yarn passes before it is ready for the loom, effects are caused, that cannot after be remedied; such being the case, thought should be given to the why and wherefore of each step.

There are conditions in some mills over which the overseer has no control, for that part he is not responsible, but speaking generally; overseers can be held responsible for the following: Production, quality and quantity; long life of the machinery; low cost of maintenance. None of these can be sacrificed if the best is desired.

THE SPOOLER.

This machine is used to transfer the yarn from the ring spinning frame or mule, to the spools, which are afterwards placed in the creel of the warper. This machine has a bearing

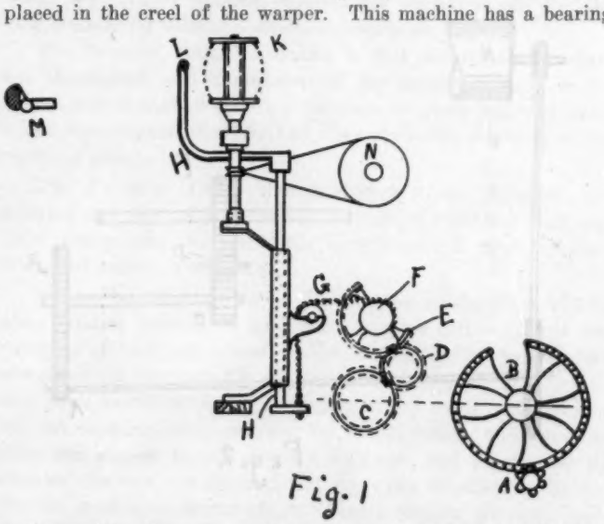


Fig. 1

on the quality of warps; carelessness at this stage will spoil what might otherwise be a good warp. The machine has a two-fold purpose; to transfer the yarn, also to cleanse the yarn. It is here that slugs caused by poor spinning, excessive lint, and poor piecing on the spinning frame, can be eliminated.

The machine must be run at a speed proportionate to the quality of yarn that has to be transferred, in addition this fact must be considered: the spools run by gravity, that is, they rest on the base of the spindle, and while the speed may be in proportion to the yarn when the spool is almost empty, as the yarn on the spool increases, so does the speed of the yarn from the bobbin to the spool; this materially affects the yarn, and is costly, because the added strain causes the yarn to break, which means loss in production, and loss in quality, because of the many knots that will be in the warp. It is impossible to realize the loss from these two great faults, unless the following principle, which is becoming more widely recognized, has been tried, namely: a trifle less speed for the ultimate end of gaining quality and quantity. As the mills in these parts develop the finer grades of yarn, so the truth stated will be more readily recognized. Why some persons who are in charge continue with the old fallacy of excessive speed to gain production, it is impossible for us to realize, particularly when we know that mill statistics prove it to be the opposite from the truth. Spooler tenders should be taught to make as small a knot as possible

for this materially affects the grade of cloth, which will be spoken of later.

There are many makes of spoolers, but all embody the same principle, so that the description of one can be taken to cover the field in general. There are three distinct motions, namely the driving of the spindle by means of the drum, the building of the yarn on the spool by means of the builder motion, and the holding of the bobbin a cop of yarn, and guiding the same onto the spool. Fig. 1 shows sectional view of the builder motion. *A*, small pinion which drives the mangle wheel *B*; *C*, traverse gear, which is on the same shaft as the mangle; the carrier gear *D* transmits motion to the segment *E*; the segment *E* is fixed to a shaft that extends the length of the machine, and on this shaft at stated distances, small pulleys *F* are fixed; to these pulleys the traverse chains *G* are attached; the lower end of the traverse chain is connected to the traverse rod *H*, which lifts the builder rail. On long machines two mangle gears are used so as to give uniformity of lift, which means equal traverse through the whole machine. The mangle gear is illiptical in shape, and the purpose of this is to build the yarn on

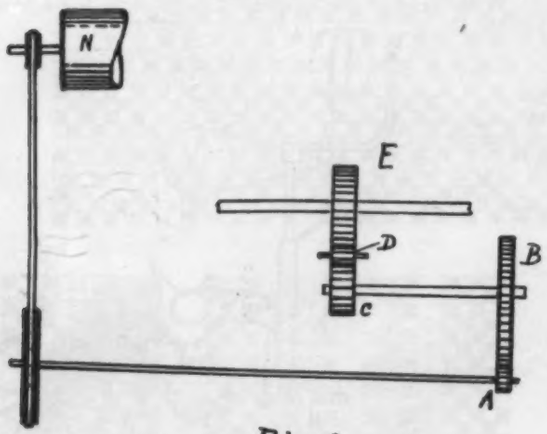


Fig. 2

the spool in convex form, allowing a greater amount of yarn to be placed on a spool than would be the case if the yarn were placed on straight from head to head. Fig. 2 shows the method of driving the builder, the same letters being used as in Fig. 1. The small pinion that drives the mangle rotates on the inside and outside of the mangle wheel, and to keep the gear in contact with the bars a teeth of the mangle when turning from the inside to outside, a flange is placed on the outer portion of the mangle gear, extending for about one quarter the distance round the gear, at each side of the open space. The portion of the shaft that extends beyond the small pinion works inside the flange, this extension also works in a groove on the inside of the mangle. The small pinion is passing around the ends when the traverse is at the bottom or top of the spool. Owing to the greater diameter of the mangle gear from 1 to 2 than from 3 to 4, a greater distance has to be traversed by the pinion, which causes the builder to work a trifle slower at that point, consequently there is a greater amount of yarn placed on the spool at this time, hence the converse shape of the yarn on the spool. When calculating the speed of the traverse, there is a difference of opinion as to whether the mangle ought to be calculated according to the number of teeth in the gear, or increase the number. We believe the number should be increased by two as the small pinion rotates on the inside and outside of the end teeth, and there is a slight pause while passing round the ends.

THE SPEED OF THE TRAVERSE.

Rev. of main driving shaft		Pulley on main shaft		Pulley on shaft machine		Small pinion	
300	x	5½″	x	2¼″		6″	= 4.18 traverses per minute
10″ Pulley on machine shaft	x	10½″ Pulley on small pinion shaft	x	62 Teeth of mangiegear			

Fig. 3.

The entire builder rail can be adjusted by the adjusting nuts at the connection of the chain to *H*. If as is sometimes necessary, one spool is not building right, the guide can be adjusted to overcome this fault.

Fig. 3 represents the Curtis thread guide. The manner in which the adjustable plate *A* is set, determines the quality of warp; the guide can be and must be adjusted to the counts of yarn that is being spooled; if the slot through which the yarn passes is too close, the yarn is not only chafed, but often broken; if the slot is too wide, slugs and uneven places on the yarn are allowed to pass, and there is no means of taking them out afterwards. The rounded lip *B*, is a decided advantage over the old style thread guide, as will readily be seen by a glance at Fig. 4. This form of guide was made of flat steel about ⅛-inch in thickness; it was necessary to change the flat guide for widely different counts of yarn.

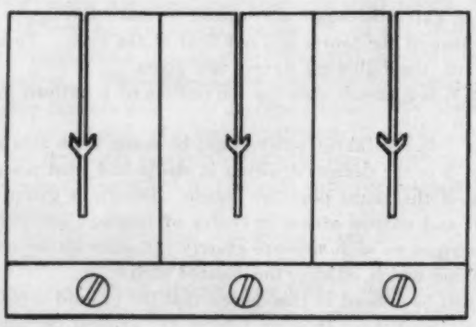


Fig. 4,

BOBBIN HOLDER.

When the yarn has to be transferred from the pirn or ring spinning frame bobbin, a bobbin holder is used as shown in Fig. 5; this is fixed to a rod that extends the length of the machine. It is necessary that the holder be set at the right angle, otherwise there will be greater strain on the yarn when being drawn from one end of the bobbin. This is not only detrimental to the yarn, but will cause less production, owing to the greater drag on the spool. Holders are made with two swinging wires as shown, or a wire on one side and a solid casting on the other. The wires serve a two-fold purpose: they keep the bobbin in place and add a small amount of friction; excessive friction is detrimental

as it drags the spool and strains the yarn. When two wires are used, they swing with the bobbin, so that the bobbin does not meet solid resistance and yet there is sufficient tension on the yarn to prevent a soft spool. The yarn is most always drawn from underneath the wire on the right-hand side; occasionally if the yarn is very tender, the yarn is drawn from between the wire, but this tends to make a soft spool.

When cop yarn has to be transferred, the machine is equipped with upright spindles in place of the bobbin holder, and to add friction to the yarn, a wood bar covered with felt is attached to the upper portion of the builder near the thread guides. The felt also assists in cleansing the yarn.

The method of banding or driving the spindles is a disputed point, opinions differing as to whether single, double, or multiple

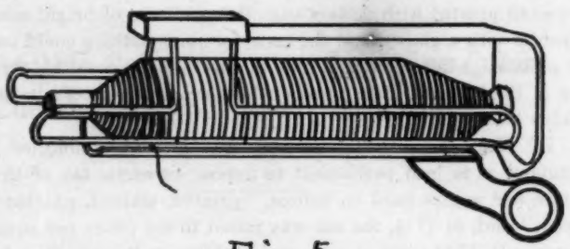


Fig. 5.

banding is the better. When single bands are used, only one spindle runs slow or stops if the band becomes loose or break, and it is claimed that one spindle is not as readily noticed as when several run slow or stop if the multiple banding is used; in addition, it is claimed the band lasts much longer on the multiple principle than on the single, which is a fact, but, does this longer length of life of the band offset the much longer time it takes to replace a broken multiple band, than it does to replace a single band? In some cases it does but is mainly a question of efficiency and watchfulness; again, if it is an old machine it will be found that the end spindle with the multiple banding does not travel as fast as the other, because the return band rides on the band in the whirl which is traveling in the opposite direction, this also tends to wear the band. In the later machenis, particularly the Whitier, a double whirl is placed on the end spindle to overcome the fault mentioned. The double band is claimed by many to be the best method.

The counts and quality of the yarn being spooled must be taken into consideration, when deciding the speed of the spindle. The spindle for a combed 40s can be run faster than for a carded 40s even with the same grade of cotton originally. We have seen this: 10 per cent less production on carded Peeler than combed Peeler of the same counts, and the speed had to be reduced on the carded stock to get good production. A point that ought to be considered more than it is, is the tying of the broken ends; the large knots that some spooler tenders make ought to be completely eliminated, and some do not even tie the ends but twist them; these cause endless trouble and many pick out in the weave room.

TO FIGURE THE SPEED OF THE SPINDLE.

$$\frac{\text{Rev. of main driving shaft } 300 \times \text{Pulley on main shaft } 5\tfrac{1}{2}'' \times \text{Dia. of drum } 6''}{\text{Diam. of machine pulley } 10'' \times \text{Diam. of whirl } 1\tfrac{5}{16}''} = 755.72 \text{ rev. per minute}$$

The production is about as follows:

Speed of Spindle. 825 rev.	Counts of Yarn.	Speed of Spindle. 750 rev.	Counts of Yarn.
Pounds per Spindle per Day.		Pounds per Spindle per Day.	
5.75	16s	1.75	50s
4.2	22s	1.4	60s
3.3	28s	1.1	80s
2.3	40s		

The traverse is increased by increasing the size of the traverse gear; two teeth making an increase of ¼-inch, 40 teeth giving a 5-inch traverse.

The size of spool and traverse is decreased for finer counts; up to 24s, 6-inch spool with 5-inch head; 26 to 36 or 40 counts 5x4-inch; 70s to 100s counts about 2 or 3½x2¾-inch.

CLOSER RELATIONS BETWEEN PRODUCERS AND MANUFACTURERS.

BY S. C. BARRETT, ATWATER, GA.

I esteem it not less a pleasure than a privilege to meet you in conference today, and to discuss with you some of the things which we hold in common interest for ourselves and for the vast commercial relations which we represent.

The Farmers' Union recognizes in full and respectful measure the dignity and importance of this association, and as its official representative it is my pleasure to greet you with confident expectations of better and more profitable relations in the years to come.

The Farmers' Union desires direct trade between the growers and the manufacturers. Let me say further that one chief reason why we wish this co-operation is that we may eliminate gambling in cotton.

We are building warehouse depositories in which we will be able, without damage, to hold and store our cotton against the necessity of hasty sales, and against the damage of the weather, and to keep it there until it will command such a fair and reasonable price as we think the necessities of the world will justify. We are making every preparation which reason and common sense can suggest to deal directly with you, and we are now so situated that we can do, and will do, what we say we will do. We are getting in better shape financially than we have been since the wear. We are organizing cotton companies, and we can safely promise you that with or without your co-operation, henceforth cotton will not be forced upon the markets of the world as rapidly as it is gathered from the fields. The middleman is no longer a necessity. Let us get that splendid fact in our minds to stay. As we are becoming better educated we can do for ourselves what the middleman has been accustomed to do for us. There is absolutely no necessity for us to support any longer the great army of middlemen and gamblers.

DYEING, BLEACHING, ETC.

A large number of mills using dye stuffs do not employ chemists, thinking no doubt the actual saving would not warrant the extra outlay. For the benefit of those who desire information as to the relative merits of competing colors against the products they are using, we propose to test any samples submitted to us without charge to our subscribers. It is not necessary to state trade name of color but in order to facilitate rapidity in work it is absolutely essential to explain the type or class of color and fibre for which it is intended. If a comparative money value is wanted the prices of the prespective samples sent to us should be stated. This department of course cannot take up examination of water, chemicals, sizings, etc., and only anilines and extracts are included in this offer.

CALICO PRINTING.

KNOWN AMONG THE ANCIENTS.—TOPICAL PRINTING INTRODUCED INTO EUROPE IN THE SEVENTEENTH CENTURY.—WELL ESTABLISHED IN ENGLAND BY 1712.

BY HENRY G. KITTREDGE.

I.

The ancients and classical nations seem to have attained considerable proficiency in the art of producing colored patterns on cloths, or in the art of topical dyeing, or something analogous to it, as traces of it may be discovered in various parts of India, Arabia, and China. The linen cloths of Sidon were noticed by Homer as magnificent for their colored patterns. The art of imparting tinged figures to cotton fabrics was practiced with great success from a very remote period in India; the name of calico, as applied to figured cotton cloth, being derived from Calicut, a town in the province of Malabar, where the craft was conducted on a large scale.

The inhabitants of Caucasus, according to Herodotus, adorned their garments with pictures of animals by means of an aqueous infusion of the leaves of certain trees, and the colors thus produced could not be removed by washing.

The ancient Egyptians appear to have attained such proficiency in the art of printing as could only be acquired by long and careful practice. Palempore, a flowered chintz bed cover now extensively made in Europe and the United States, was manufactured in Madras from the earliest ages when they were decorated with colors drawn upon them with the pencil or some other instrument charged with color. Samples of these goods are on exhibition in the museum of Europe, one of them being 5 yards long and 2½ broad, said to have been the labor of a Hindoo princess, which must have taken a lifetime to execute.

Topical dyeing of cotton goods must have been practiced for a considerable time in Mexico and Central America before the conquest of Cortez, as this general sent to his sovereign garments of cotton cloth from these countries with black, red, yellow, green and blue figures. Some of the tribes of the North American Indians have also been for a long time in possession of a method of applying patterns in different colors.

The art of topical printing was not introduced into Europe before the seventeenth century, when the knowledge of it was acquired by those connected with the Dutch East India Company, who first caried it to Holland from the Mallabar coast. It was practiced at Augsburg, Bavaria, towards the close of that century, and the place was then famous for its printed linens and cottons, which indicates that it must have been carried on for some time previously, and presumably long before its introduction into England.

Anderson in his History of Commerce declares that calico printing was introduced into England in 1676, but James Thomson, "a scientific and acomplished calico printer at Primrose, near Clitheroe," stated in his evidence before a select committee of the House of Commons in 1833, that the origin of printing in England "dated from about the year 1690, when a small print-ground was established on the banks of the Thames, at Richmond, by a Frenchman" who in all probability was a fugative after the revocation of the edict of Nantz. About 1690, as an incidental circumstance, large consignments of printed calicos were brought from India to England, and the fashion ran largely in favor of them for ladies' dresses, which caused the manufacturers of native textiles to feel aggrieved, as they interfered with their production of woolens; and, as a consequence, they complained to parliament that "all the mean people, the maid servants and indifferently poor persons who otherwise clothe themselves, and were usually clothed in thin woman's stuffs made at Norwich and London, are now clothed in calico or printed linen." These complaints procured an act of parliament, in 1700, prohibiting, or imposing a penalty of £200 on such importations. The law, however, failed of its purpose, as the people would not return to their old materials of dress so long as English printers were able to procure plain calicos from abroad and print and sell them at home. The result was the establishment of a home manufacture to supplant a foreign one. Thus, an act which was intended to protect English woolen and silk manufacturers from foreign competition with goods allied to them only in their uses, had the effect of stimulating and greatly increasing, instead of prohibiting, the infant trade of printing, as the English had become accustomed to the use of printed calicos and chintzes (cotton cloth printed with flowers and other patterns of bright colors finished with a glaze), and the taste for these articles could only be gratified, after the prohibition of the Indian prints, by printing in England the plain Indian calicos which were still admitted under a duty.

By 1712, the printing business was so well established in England as to lead parliament to impose an excise tax of three pence per square yard on calicos, "printed, stained, painted or dyed," and, in 1714, the tax was raised to six pence per square yard. In 1720 a law was enacted prohibiting the wearing of all printed calicos whatsoever, whether of foreign or home production, and even in goods in which cotton formed a part. This confined the printer to pure linen. It was hoped that this law would be decisive, but it could not be maintained. An exception was made in the law applying to calicos dyed blue, and muslins, neck cloths and fustians—a twilled cotton fabric variously called corduroy, moleskin, etc., according to the way it was furnished. The oppressive features of this act were repealed in 1736, so far as they related to the use or wear of printed goods of a mixed kind containing cotton, and allowed clothes of linen warp and cotton weft to be printed.

About this time the French government pursued the same policy as England, and in order to favor the silk manufacturer of that country prohibited under severe penalty the wearing of chintz and printed linens and cottons, and these prohibitions were not annuled till 1759.

In an English work published in 1728, entitled "A Plan of the English Commerce," mention is made of the printing trade as it then existed as follows: "The late acts prohibiting the use and wearing of painted calicos either in clothes, equipages or house furniture, were, without question, aimed at improving the consumption of our woolen manufacture, and, in part, it had an effect that way. But the humor of the people running another way, and being used to and pleased with the light, easy and gay dress of the calicos, the calico printers fell to work to imitate these by making the same stamps and impressions, and, with the same beauty of colors, upon linen, and thus they fell upon two particular branches of linen called Scots linen and Irish linen. So that this is an article wholly new in trade and indeed the printing itself is wholly new, for it is but a few years ago since no such thing as painting or printing of linen or calico was known in England, all being supplied so cheap and performed so very fine in India, that nothing but a prohibition of foreign printed calicos could raise it up to a manufacture at home; whereas now it is so increased that the parliament has thought it of magnitude sufficient to lay a tax upon it and a considerable revenue is raised by it."

The business of printing linens and mixed goods having supplanted, in a measure, that of printing calicos, continued to extend, though more slowly than would have been the case if the

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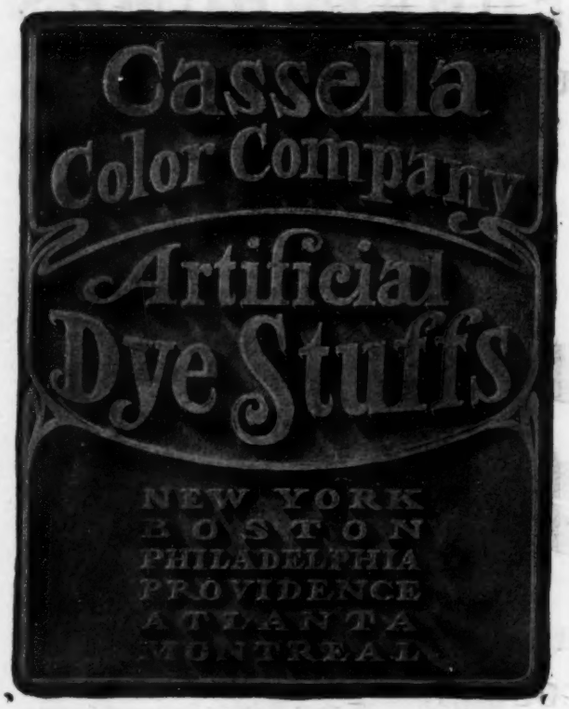

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printing of calicos had been permitted. It was computed that there were, about the year 1750, 50,000 pieces of mixed linen and cotton goods annually printed in Great Britain, chiefly in the neighborhood of London; the cloth being principally of a kind called Blackburn grays, woven at Blackburn of linen warp and cotton weft.

In 1754, the art of printing had apparently attained considerable excellence, as it was stated in the *Gentleman's Magazine* of that year that a Mr. Sedgwick—a wholesale trader in printed goods—"had the honor to present her Royal Highness, the Princess of Wales, with a piece of English chintz of excellent workmanship printed on a British cotton,"—probably a fabric of cotton and linen mixed,—"which, being of our own manufacture, her Royal Highness was most graciously pleased to accept." Her Highness was pleased to say in return that she was "very glad we had arrived at so great a perfection in the art of printing," and that in her opinion it was preferable to any Indian chintz whatsoever, and she gave orders to have it made up into a garment for her own wear "as an encouragement to the labor and ingenuity of the country."

DYEING MERCERIZED YARNS.

Everyone who has much to do with dyeing mercerized yarn knows that it is a common occurrence for streaks or specks to make their appearance in it during or after dyeing, and this unpleasant phenomenon seems to appear very capriciously at uncertain intervals and for no obvious reason. As a matter of fact the cause of these unlevelnesses is sometimes defective mercerization, and sometimes defective dyeing, and a dyer who does not do his own mercerizing often finds it very difficult to tell whether the appearance of specks is his fault or that of the mercerizer. The best method is to dye some yarn known to be properly mercerized with the parcel. If the known yarn dyes unlevel, the fault must be in the mercerization of the latter.

Once a yarn has been unequally mercerized, it is very difficult to get it right again. Re-mercerizing is useless, as it simply intensifies the difference between one part and another. Even repeated coloring has no effect upon the stains. The stains show even through dark dyes and nothing will hide them except black. The following method can be recommended, but it must be practised before the yarn is dyed.

For every 100 lb. of goods prepare a bath with water at 50 deg. C., adding from 3 to 4 lb. of strong spirits of wine. Give six ends and rinse in cold water. Then give a fresh bath as short as possible, containing 10 oz. of permanganate. Work a few times cold and then a few times at 40 deg. C. Lift when the bath is exhausted and enter the browned yarn into a fresh bath, also short, containing sodium bisulphite and sulphuric acid. When the yarn is bleached, rinse, work for half an hour in boiling very dilute ammonia, rinse and dry.

To prevent unequal dyeing and properly mercerized yarn, the following points must be attended to. To prevent entanglement and felting of unmercerized hanks they are packed close and boiled in soft water for two or three hours, best under pressure. Then rinse in the washing machine and centrifuge. The goods must not be left in the dirty scouring water or particles of dirt therefrom will settle on them and resist removal by mere rinsing. The patches of dirt will afterwards act as reserves against the dye. After centrifuging mercerize without delay. I fthe goods are left lying they are very apt to get drier in one part than another, and uniform impregnation with the lye is then impossible, also level dyeing. Again the want of uniformity in the mercerization often causes tearing on the stretching frame. The stretching must be perfectly uniform so that every thread gets the same tension.

Concluded on page 238.

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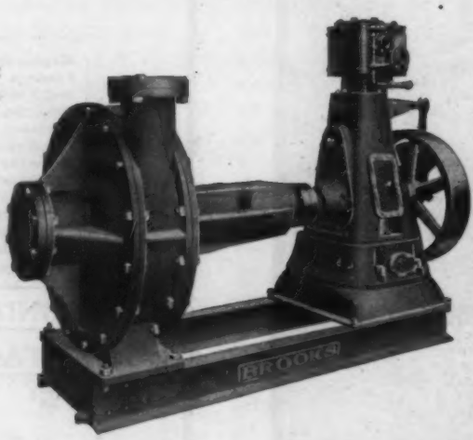

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After rinsing, the mercerized hanks are soured with 10 lb. of sulphuric acid or better 20 lb. of hydrochloric. The goods must be constantly worked to insure that all parts are soured alike, and the subsequent rinsing must be thorough. Any traces of acid left will tender the goods on drying. The preliminary operations are now concluded if it is merely a question of dyeing medium or dark shades, but they must be followed by a bleaching for light hues. This is done in the ordinary way with the usual and most important precaution that, if the scouring is done in an open pan, the goods are kept below the surface throughout the operation. Bleaching should never be done unnecessarily, as substantive dyes go more easily and more uniformly on unbleached than on bleached cotton.

The difficulty of dyeing is, of course, due to the increased affinity for dyes imparted by mercerization. The first rule to be observed is not to dye more at a time than can be rapidly handled. The second is to cut down the amount of mordants and assistants as low as possible. For example, 3 lbs. only of tannin are used for mercerized stuff where 4 lbs. would be required for ordinary goods. It is a common mistake to employ the same tannin bath for different shades. Even in the use of the same dye on mercerized cotton, the strength of the tannin both must be less for light than for dark dyes. The brightest shades are obtained with basic dyes on an antimony tanin mordant, or by topping on substantive dyes. The basic dyebath must be rather long, be used cold, and be made distinctly acid with acetic acid. The dye is added at intervals as a filtered solution. For very light shades soap should be added to the dyebath.

Benzidines and diamines are largely used on account of the ease with which they are used and they suffice for most purposes. The bath is prepared with dye, 1 per cent of soda, and about 1 per cent of Turkey-red oil. Enter at 40 deg. C. per cent of sdoium phosphate, for dark shades from 3 to 8 per cent and work half an hour. Then add for light shades from 2 to 5 per cent. of crystalized glauber's salt, and for black 50 per cent of the same. The very palest shades are done best without any assistant whatever. The goods are then topped with basic dyes. If great fastness is a consideration it is best to use the sulphur dyes. With these the heat of entry may be as high as 50 or even 70

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10 grams of well sampled bleaching powder are transferred to a mortar, a little water added and triturated until of a creamy consistency. The liquid portion is poured in a one liter graduated flask, more water added to the residue in mortar and trituration continued—this is repeated several times. The mortar is finally well washed into the flask, and the solution made up to the mark of one liter.

The solution is well shaken and 50 c c of it while milky transferred to a beaker. Three grams of potassium iodine dissolved in 50 c c water is now added. Add enough hydrochloric acid to give the faintest acid reaction. The iodine which is set free is determined by means of the sulphite solution for every 127 parts of sulphur there will be 35.5 parts of chlorine present. 50 c c contains 500 grams bleaching powder.

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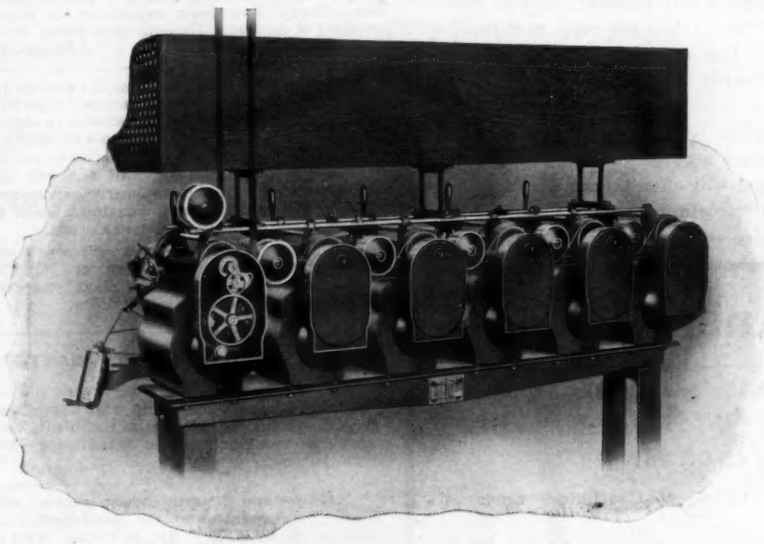

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The largest order for steel rails ever placed with a single concern was made public May 11. This was the order for 150,000 tons of steel rails placed by the Harriman lines with the Tennessee Coal and Iron Co., for delivery after March, 1908. In order to handle its greatly increased business the Tennessee Coal & Iron Co., has just placed an order with the Crocker-Wheeler Company, of Ampere, N. J., for the complete electric motor equipment of its new steel rail mill at Birmingham, Ala.

The Rosemary Manufacturing Co., of Roanoke Rapids, N. C., which from the start has been a leader in the manufacture of damask, is now starting up 150 looms, on a variety of new damask fabrics. To fully supply the increased trade on these fabrics, the company will make large additions to both of its mills this year, increasing its equipment from 200 to 300 looms, making a total equipment of over 700 looms and about 27,000 spindles.

The fifth edition of the Canadian Textile Directory, published by Biggar Wilson, Limited, Toronto, Canada, will be issued on July 1st, of this year. This directory will contain the most reliable information about the Canadian textile mills, and classified lists of all classes of manufacturers converting textile fabrics, as well as manufacturers' agents and jobbers. Special features of this book, which sells for two dollars per copy, post-paid, will be the new Canadian tariff just passed by Parliament, and a complete list of Canadian Boards of Trade.

James Taylor, Philadelphia, has purchased the entire knitting, finishing and dyeing machinery of the Oatka Hosiery Company, of Warsaw, N. Y., and will offer the same in lots to suit purchaser. This is a good opportunity to buy this class of machinery, including loopers, presses, dryers, singeing machines, etc.

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Overseer of carding or spinning. Position wanted by man who knows the business. Good manager of help, can give references. Address 17, care of Cotton.

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Manager of Cotton Mill open for an engagement. Technical knowledge and twenty-five years practical experience, on variety, plain and fancy work. Over 20 years in executive capacity with two mills. Highest credentials and record evidences of results. Address 19, care of Cotton.

Superintendent of plain mill, but will take position as overseer of plain weaving. Seventeen years' experience as overseer of warping, slashing, drawing in and weaving. Held position as superintendent eleven years. Address 20, care Cotton.

Treasurer, General Manager, or Superintendent for experienced cotton manufacturer. Large plant preferred. Record twenty years' submitted. Address 21, care Cotton.

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Superintendent, about forty years old, wanted for a large textile plant in Rhode Island. One who has progressive ideas, a thoroughly practical, and, if possible, a technical knowledge of, and an actual working experience in the manufacture of knit goods. Address 22, care Cotton.

Manager and Superintendent wanted, who is able to undertake the general management of the construction of four cotton mills on the lines of the M. K. & T. Ry., in Texas. Two of these companies are now completely organized, and the stock all sold. The other two companies are in process of organization. Two of the mills will be complete and running by late fall. The expectation is to make only gray goods. Applicant for the position must be a man of long experience and ability. He will be expected to work in conjunction with architects and contractors until mills are completed, when he will have the general superintendency of all. It is the expectation to pay such a man a salary in keeping with the importance and responsibility of the position. Address 23, care Cotton.

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Salesman wanted, calling on textile mills to handle as a side line a preparation for low grade cotton cloth. Good proposition. Address Nicetown Mfg. Co., Nicetown, Phila.

Party, with capital, wanted to enable the owne of an established patented device for cotton mills to open a Southern factory. From $10,000.00 to $15,000.00 required. Full and satisfactory guarantee. Address Capital, care Cotton.

Commission House, with offices in Philadelphia and New York, selling cotton yarns, desires the account of a Southern mill that is open for a proposition of this kind. Those interested will be put in communication with the proper parties by addressing D. W. Burrell, 123 Liberty Street, New York City, Room 503.